STARTING THIS ISSUE: WENDY WOODS' NEWSBYTES™

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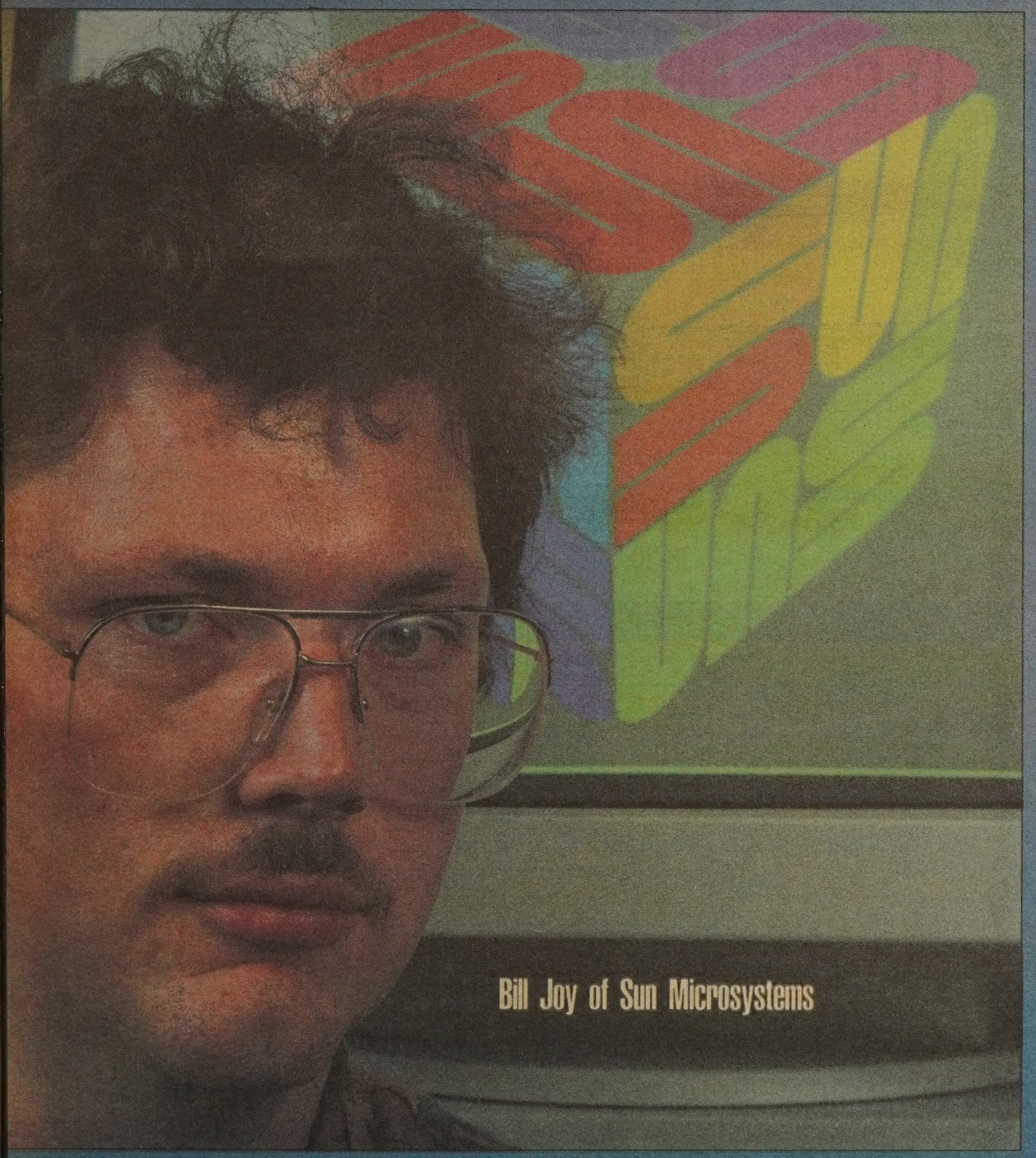
California's Computer Magazine

AUG. 1987 • ISSUE 34

MicroTimes™



Bill Joy of Sun Microsystems

JAN LEWIS ON TRADE SANCTIONS:
Forget Pearl Harbor —Remember Detroit

NEW THIS MONTH

Dvorak's Last Column
By John C. Dvorak

SPECIAL SECTION
MAC @ WORK

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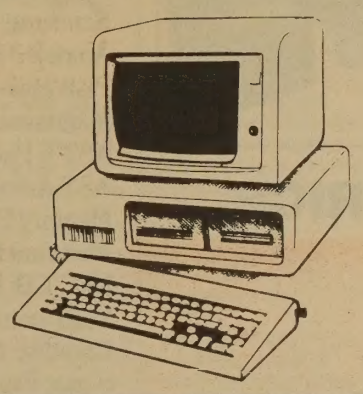

- ★ 512K RAM ON MOTHERBOARD
- ★ PHOENIX BIOS
- ★ CPU 80286
- ★ SWITCHABLE 6/10 MHz
- ★ HIGH QUALITY METAL CASE
- ★ 200 WATT POWER SUPPLY
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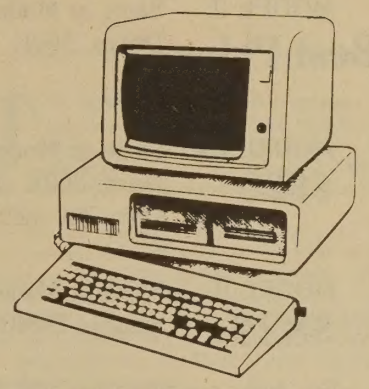

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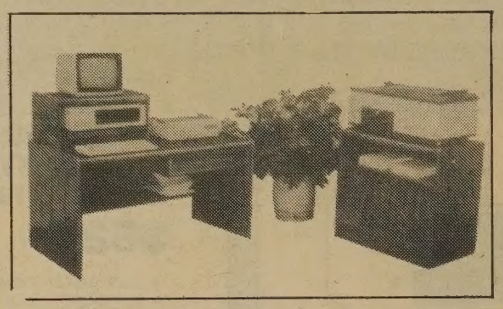

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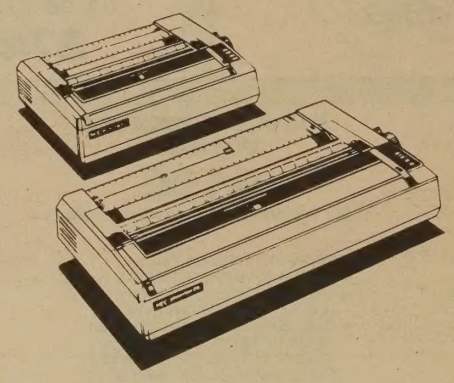

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LQ 800
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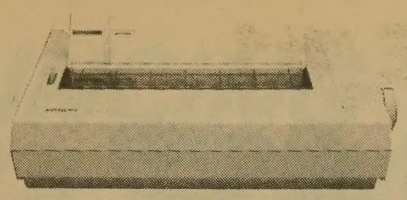
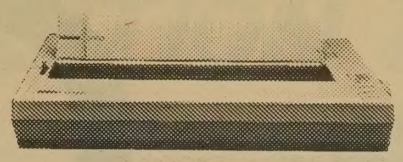


$429

- This 80-column 24 pin dot-matrix Letter Quality printer delivers outstanding results.
- Prints at 180 characters per second print head speed in draft mode, or 60 characters per second in Letter Quality mode.
- Front panel fingertip selection of Letter Quality or draft mode.
- Identity Modules allow you to choose between Extended Epson, IBM 5152 Graphics or Diablo 630 codes.
- Optional font modules give you the printed look you desire.
- Built-in 7K buffer allows you to use your computer while printing continues.

LQ 1000 W/Tractor
DOT-MATRIX PRINTER



132 Columns

SAME FEATURES
as LQ-800

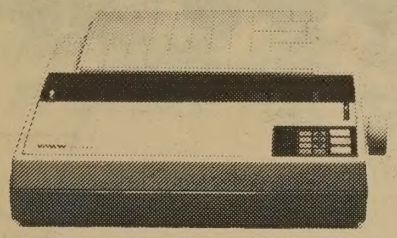
$545

EX 800
DOT-MATRIX PRINTER

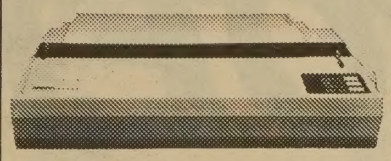
$375

The high speed business printer for high productivity offices. Fast, efficient and durable, the EX-800 is the right choice where volume printing and ease of use is a must. It prints an ultra-fast 300 characters per second printhead speed in 12 characters per inch draft mode. Prints a page of text in approximately 15 seconds. Want the quality of typewriter-style characters? Simply switch to the 60 characters per second printhead speed Near Letter Quality mode. The EX-800 also prints text and graphics bidirectionally.

Epson's revolutionary new SelecType II feature lets you choose from eight different typestyles simply by touching one of the clearly marked illuminated buttons on the front control panel. No need to access control codes through software.



EX 1000
DOT-MATRIX PRINTER

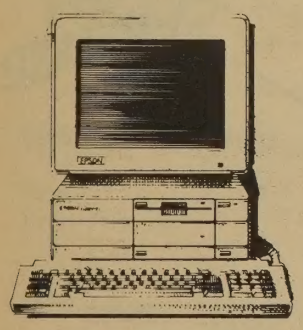


ONLY $499

The high speed wide carriage printer. Designed for corporate level and small business printing tasks, the high speed EX-1000 is as versatile as you need it to be. Print high speed drafts, near letter quality copies and graphics of unsurpassed detail.

At 300 characters per second printhead speed in 12 characters per inch draft mode, the EX-1000 will boost throughput beyond the capabilities of ordinary office printers. To make the right impression, switch to the 60 characters per second Near Letter Quality mode for printing results that rival an office typewriter. And for maximum throughput, the EX-1000 prints text and graphics bidirectionally.

The EX-1000 has a 136-column carriage for fanfold and ledger paper up to 16-inches wide—perfect for printing spreadhseets. Even create customized documents using SelecType II. With fingertip ease select from eight different typestyles from the illuminate front control panel.



EQUITY I

Dual Floppy 360K
MS DOS/GW-Basic
Mono Card +Monitor
Parallel/Serial

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One Floppy 360K
20 MB Hard Disk
MS DOS/GW-Basic
Mono Card +Monitor

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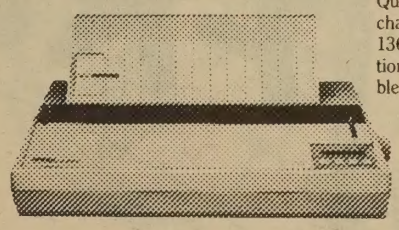
LQ 2500
DOT-MATRIX PRINTER



Top-of-the-line 24-pin dot-matrix performance. The advanced LQ-2500 offers high speed and dot-matrix versatility with letter quality printing at the touch of a button. In the high speed draft mode, print spreadsheets, mailing lists and first drafts of text at a fast 324 characters per second printhead speed. For added versatility, switch to the Letter Quality mode creating crisp characters at 108 characters per second. And for fast throughput, the 136-column LQ-2500 prints text and graphics bidirectionally. It also has five resident fonts that are accessible with the touch of a button.

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LX-800 $184 FX-286e $449 FX-86e $299

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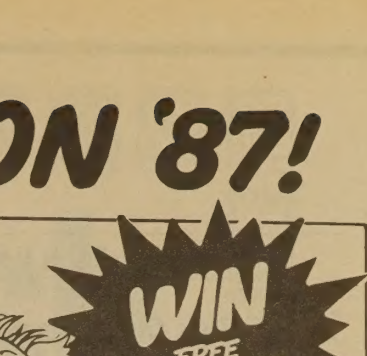

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FREE SEMINARS:

Seminar Room A
Friday, July 10

11:00-Noon	Keynote Speaker: Bill Gates of Microsoft
1:00-2:00 pm	Speaker of Interest: To Be Announced
3:00-4:00 pm	Lotus "The Lotus Family; Focusing On HAL and 1-2-3
4:30-5:30 pm	Ashton-Tate

SEE BILL GATES JULY 10TH 11:00 AM

Seminar Room #203

Time	Friday July 10	Saturday July 11th	Sunday July 12th
10:30-11:30 am		**Paperback** "Integration of VP Series Products"	**Microrim**
12:00-1:00 pm	**Spinnaker** "One Minute Manager"	**Activision** "Portal, The First Computer Novel of Fantasy and Adventure" by Rob Swigart	**Ansa** "Paradox 2.0; The Single and Multiuser Answer
2:00-3:00 pm	**Micropro** "Word Publishing; A New Era in Word Processing"	**Microsoft** "Evolution of BASIC"	**Broderbund** "The Other Side of Broderbund Personal Productivity Tools"
3:30-4:30 pm	**Software Publishing** "Harvard Graphics"	**DAC Software** "DAC Easy Accounting 2.0"	**Electronic Arts** "Chuck Yeager's Advanced Flight Simulator; A Realistic Sensation of High Speed and Flight"
5:00-6:00 pm	**Bytel** "Build dBASE Applications Using Genifer"	**Symantec**	**Davidson** See the latest in educational software; "Math Blaster and Read-n'-Roll"
6:30-7:30 pm	**Star Monogram** "Automating Your Small Business"	**Lotus** "The Lotus Family; Focusing on: Document Creation Using Freelance+ and Manuscript"	

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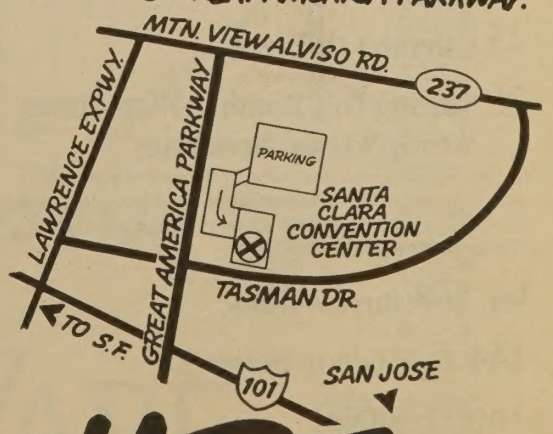

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FEATURES

56 Infinity's Grand Slam
By Sharon Rufener
Emeryville startup pioneers sophisticated Amiga software.

HANDS ON

84 Trumpcards
By Aubrey Pilgrim
Increase your PC's storage capacity with these hard-disks-on-cards.

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Unnoticed by many micro users, Sun Microsystems has been building powerful microprocessor-baased workstations for some time now, and has recently announced a price reduction on its low-end 3/50 machine — to $4995 — to make it directly competitive with PC-based technical workstations. Co-founder and UNIX wizard Bill Joy of Sun discusses the company, its history, and its remarkably successful strategies.

Cover and contents photos: Billy Douglas, Pat Johnson Studies

According to Bill Joy, Sun's business is building real computers based on microprocessor technology.

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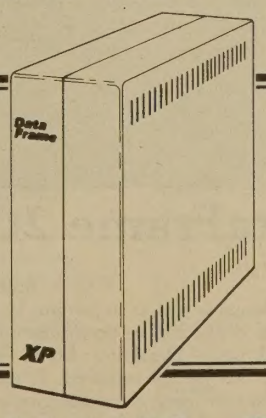

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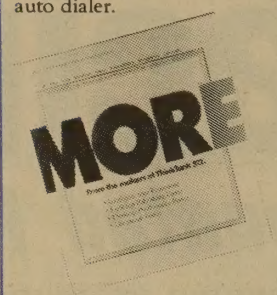

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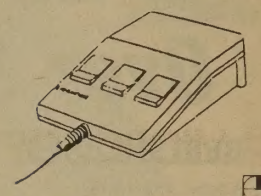

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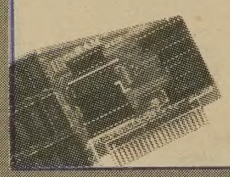

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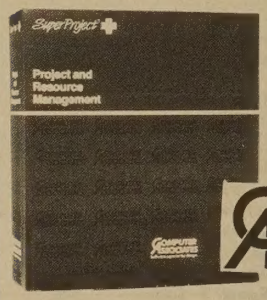

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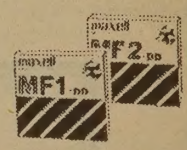

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DataFrame's design is just as important as its performance. The drive comes preformatted so its simple to hook up — DataFrame boots from the hard disk with no floppy required. It takes full advantage of the new hierarchcial file system, so all 20 megabytes are available all the time with room to expand up to 8 drives. 5¼" disk drive.

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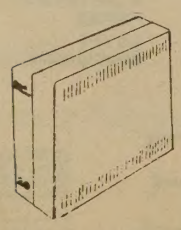

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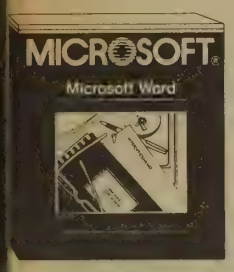

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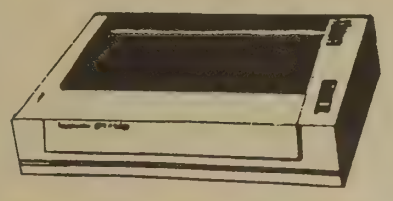

Amiga 500 system
1 meg CPU, RGB Monitor, Mouse

Amiga

The Amiga 500 consists of the Main Unit and a separate power supply. The Main Unit includes a Motorola 68000 microprocessor, 512K of RAM, a 3½" floppy disk drive, a keyboard with 10 function keys and a numeric keypad, and a variety of connectors and ports through which a monitor and peripheral equipment may be attached.

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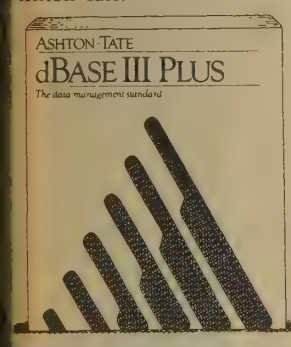

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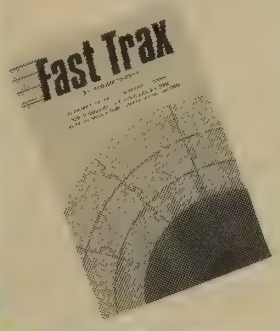

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Amiga

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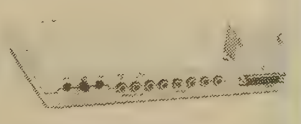

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Amiga

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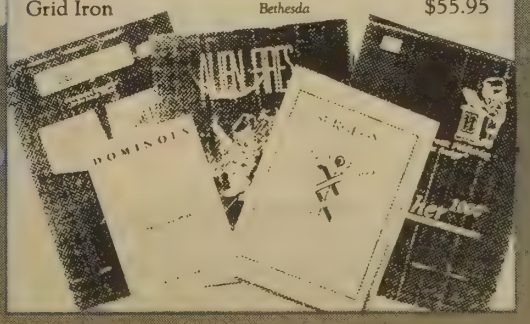

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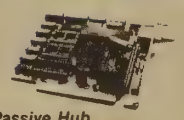
- SUNTOUCH 101K enhanced keyboard, mechanical keyswitch

NETWORKING



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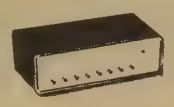

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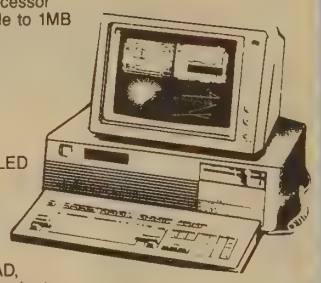

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- 150 watt power supply
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• ST-4096 Seagate 80MB full height (28ms)	1195	1175
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• Teac 360K floppy drive	89	86
• Teac 1.2MB floppy drive	125	119

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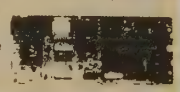

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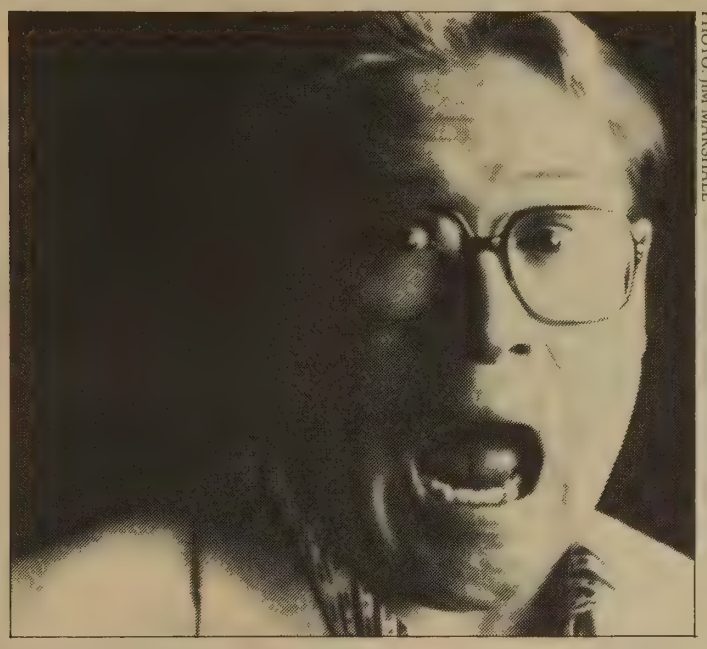

PHOTO: JIM MARSHALL

Dvorak Unleashed On Unsuspecting MicroTimes Readers! See last page.

Non-Stuffed Shirts For Dvorak

Thank you *MicroTimes!* I was beginning to think I was the only **micro user** with a **sense of humor.** That feeling developed as I continued to read **raps on John Dvorak.** Statements from readers (of a variety of publications) always seemed to discount him as a **nonsensical** writer; no place for him in a "sophisticated" publication; **childish or uninformed.**

I like Dvorak! I like his **style, his humor,** and I think there's a lot of room for it in the stuffed shirt world of computers. I've enjoyed his articles, regardless of publication, and delighted in seeing him on your **cover** (July'87) with the accompanying interview.

Oh, and by the way ... tell John I'm a **PC user.**

Jim Edwards
La Crescenta

Software Pirates Beware

Westlake Data Corporation offers a $2,000.00 reward to any individual who provides information leading to the apprehension and indictment of anyone responsible for placing *PathMinder* or any other Westlake Data software product on a computer bulletin board for downloading. No Westlake Data software product is now or ever has been Freeware or Shareware. Anyone who has information about any bulletin board offering the ability to download *PathMinder* or any other Westlake Data software is urged to call and write Westlake Data. Contact Dick Hodgkins, President or Frank Tantalo, Vice-president and General Manager. Phone number: (512) 328-1041. P.O. Box 1711, Austin, TX 78767.

Westlake Data urgently requests *MicroTimes* that this reward notice be given immediate attention and prominent notice in publication. This industry must begin to clean up its act. The enemy this time is not foreign. Westlake Data has for three years produced highly rated products at reasonable prices without the burden of being copy protected. It is time that the abuses of such pirating be stamped out.

F.P. Tantalo
Vice-President
Westlake Data Corporation
Austin, TX

Another Hacker For UNIX

Bennett Falk's column "The Hapless User's Tale" [July NC/August SC] is a wonderful exposition of what some of us like about UNIX (and others hate). UNIX is suited to the hacker mentality, which is mainly interested in seeing if something can be done and how quickly or in how short a series of commands.

Which is not to say UNIX isn't useful. It is so useful that there's just no comparison with things like MS-DOS. But the playful, exploratory attitude it encourages isn't apparently for everyone, and probably turns off a lot of business people. Which is one reason why all the MS-DOS folk are looking down the street waiting for the OS/2 bus to finally arrive, and ignoring the 100-story UNIX skyscraper right next to them.

Harry Henderson
The WELL

MicroTimes Opens The Portals Of Knowledge

Often I get mail from our users about things they have heard about or seen which relate to us and The Portal System™. We have an interesting and loyal user base, and your recent article about us in *MicroTimes* has touched our users, as well as significantly increased the general public interest in Portal.

The following remark, which I clipped from a letter sent to me by one of our users, shows some of the response we've been getting:

"Hey Phil ... The *MicroTimes* article on Portal was real good. I think it will give you and John some good exposure. It explained some things about the system that I didn't know."

(John is John Little, co-founder with myself.)

I think this shows the quality of your publication and of the writing by Corinne Cullen Hawkins. You have managed to show something new to one of our existing users! I guess that's just one of the reasons I continue to look forward to my next issue of *MicroTimes.* (One of the few industry publications I actually still enjoy.)

Phil Sih
Portal Communications Company
Cupertino

Readers interested in more information about The Portal System are invited to call 408/973-9111 voice, 408/725-0561 data 300/1200, 408/725-0569 data 2400.

— eds.

Jaded Gamers, Take Heart

I read with interest your recent interview of John Dvorak. In the article, Mr. Dvorak mentioned an apparent lack of new ideas in the computer gaming market. Perhaps this is a consequence of having not heard of the game of *Core War.*

Far from the shoot-em up alien massacres and longwinded poetic monologues, *Core War* is a first class game requiring the highest quality play. Only one person is required to play, although competition makes the action more fun. To play *Core War,* a person must first write a program, called a Warrior, in an assembler language called Redcode. The warrior is then assembled and contested against another warrior, which is also assembled. The players then sit back, relax, and watch the game as it plays. The players, looking at the graphic display of their favorite computer, see the effects of their warriors. In the display are color changes, pixel by pixel, mapping the locations of memory accessed by the warriors, each warrior denoted by a different color. In the current standard, only two warriors battle at a time, and only in a space between 1K and 8K instructions in size. Redcode is an imaginary assembler language supported through the use of simulation systems. The beauty of *Core War* is that it may be transported to any Turing machine.

While the above description is accurate and complete, perhaps you'll find the enclosed issue of The Core War Newsletter to be helpful. The newsletter is printed quarterly and distributed to the nearly 150 subscribers worldwide. As well as providing a means of communication amongst Core War enthusiasts, The Core War Newsletter acts as the official publication of the International Core Wars Society. In this capacity, the newsletter keeps society members informed of society business and activities.

William R. Buckley
Publisher, The Core War Newsletter
Huntington Beach

Prospective Core War enthusiasts are invited to write Mr. Buckley at AMRAN, 5712 Kern Drive, Huntington Beach, CA 92649.

— eds

Corrections

MicroTimes ran an ad on page 60 of the June issue for The Computer Store in Mountain View which did not include the company name and address. The AT Look Alike for $949 and the XT Turbo for $499 are products for The Computer Store, not Computer Graphics Center, Inc. We sincerely apologize to anyone who was inconvenienced by this error.

In the article on the CD-ROM conference in the same issue, there were several inaccuracies in the discussion of the Visual Dictionary CD-ROM application under development for Editions Quebec/Amerique-Facts On File, which have been brought to our attention by Carolyn Kuhn, the project manager. The prototype was developed in five months, not five years; the size of the prototype is 72 megabytes; and the production edition of the CD-ROM will include 1,000 images with over 10,000 terms in French, English and Spanish.

Also, contrary to what we reported, the CD-ROM is still in the prototype stage; the book version has sold over 100,000 copies. Finally, the Department of Education has not been involved in the project; the client is Editions Quebec/Amerique-Facts On File. For further information on this project, please contact Carolyn Kuhn at Software Mart, Inc., (512) 346-7887 for further information.

In the same issue, in a Buyers Guide mention of *If/then,* an AI instructional package using *Lotus 1-2-3,* the phone number of If/then Solutions, the product's publisher, should have been (415) 346-5886, not 346-5885.

Also, notwithstanding references to version 1.5 of *VP-Planner* in our July NC/August SC issue, the current version is actually 1.35. Thanks to Janet Walden of Paperback Software (415/644-2116) for showing us the error of our ways.

We extend our heartfelt apologies to those who have been inconvenienced by these errors. *— eds.*

Letters are heartily encouraged. Send electronic mail to **microx** *on The WELL, (415) 332-6106. Send US Mail to 5951 Canning Street, Oakland, CA 94609. Please include your real name and the city where you live. Anonymous letters will not be printed.*

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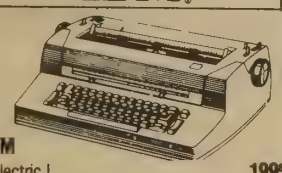

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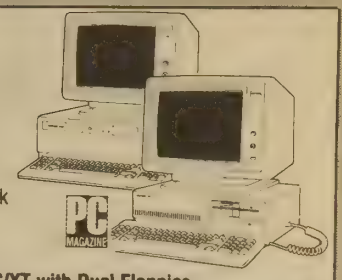

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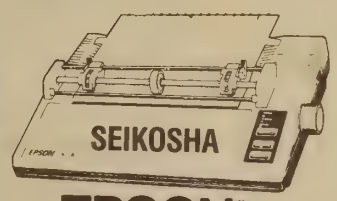

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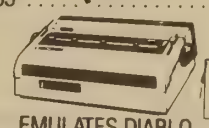

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Interview

Perspectives On Protectionism

Blue Chip Electronics' John Rossi has a unique perspective on electronics trading in the orient, particularly in Korea, the home of Hyundai, his company's part owner. The founder, president, and chairman of the board of the PC-compatible manufacturing firm examined the tariffs against Japan, focusing on U.S. marketing myopia.

What do the trade sanctions that Reagan recently passed mean to you?

I can understand what Congress and Reagan are doing, trying to force the Japanese to be a little more open in their market. But I also know that American companies don't do a very good job of marketing their products in Japan, in the Japanese style, with the sort of commitment to quality and after-sale service, personal sales, and making the kind of very long-term investment that is needed to be successful there. But just as a matter of policy, I think that protections, such as tariffs or trade wars, are never very productive. They never work. And they hurt both sides.

Why do you say they never work?

Suppose I'm an American company making 256K DRAMs and all of a sudden there's a 300 percent duty on Japanese dynamic RAMs, so that the price before the duty is $5.00 and the price after, $9.00. As an American supplier, I'm going to price my product at $8.99, just underneath the Japanese. Instead of saying, "I've got that money, I'm going to grab their market share," I'm going to hold the price down to try to seize the market share.

The interest in American companies is always the quarterly report. All the short-term, quick emphasis is on profitability for that quarter. That then turns out to be inflationary. Instead of American companies being more competitive, they're going to be less competitive. And instead of American suppliers being able to have access to low-cost semiconductors, they're going to have to pay more money for semiconductors, which are used in just about everything that you touch these days. And that's going to be passed along in the form of higher prices to...guess who? You and me. The American people. It's just a tax. My view is, if the Japanese government really wants to subsidize the American economy by dumping things, I'm ready to take them.

I'm not going to complain. Because [the Japanese] are in the types of products that they want to dump, they're really not even strategic. And yet, one of the arguments is that the American semiconductor business can't be competitive in the face of a defense problem where you need to have all this semiconductor manufacturing might. Well, that doesn't really hold water either, because the types of things they're dumping are not leading-edge technology. The M-channel 256K DRAM and the 8088-2 microprocessors or logic — that isn't where the strategic aspects of this business lie. American companies would be better off concentrating on the leading-edge technologies that, by their very nature, yield higher and better returns on investment, and take more skill and manufacturing strength than the other end of the business. I'm perfectly happy to accept gifts from foreign people, and that's really what it boils down to. But you pay, you and I pay [for the tariffs].

Do you think in the long run that we lose jobs by enforcing tariffs?

No. If you look back, most of the statistics will tell you that the computer revolution has created many more jobs that it cost, but they are in different areas.

The steel mills don't produce as much steel as they used to domestically. Why? Because it's made less expensively in Second World or Third World developing countries. So, the rightful thing for us to do is to get out of those industries in which we're not particularly competitive and get into those economies where we are. So, we may have fewer people in the steel industry, mining, or in some of these other more traditional industries and more people in high-tech jobs, with the tremendous explosion of entrepreneurial activity, many small companies, and service-related industry.

There has been, since Reagan, a net increase in the number of jobs. Unemployment is down. We do have a problem with a trade imbalance, where we are exporting far less than we import. But again, I don't necessarily see that as bad. I get the impression that a lot of American companies are just whining about an inability to sell in Japan, when they don't understand the Japanese market, making a commitment to the country — to that product, to that business — and to making the investment.

So, the problem of the closed market in Japan is a two-way street. It may be closed, but we also aren't making the same efforts to penetrate that market.

True. Again, I think the Japanese could do a lot of things to help solve some of the problems. I'll give you an example, a simple one. We were doing some business with Brother before the yen went crazy, and I got a photograph of a prototype printer on a table with three lemons in front of it. I looked at it and thought of the association of lemons with something that doesn't work. So I asked [the Brother representative], "What is this with the lemons?" And he said, "Oh, this means high quality." I said, "Why is that?" He said, "Oh, lemons are tremendously expensive in Japan. The problem is, they only grow lemons in the southern part of Japan, and there isn't much production."

"It's supply and demand. So you would expect imports. Ah, there's the problem: low quota, high duty. That's in place to protect the lemon farmers in the southern part of Japan. And that's what I think is wrong with the Japanese economy: the agricultural people really do have quite a lot of political power.

If the Japanese could at least take a few steps along the road toward making their markets more open, I think that would help at least the political feeling in the U.S. On the other hand, though, there are industries and areas that are quite open, but American companies have not been successful because of the approach.

The Japanese invented high quality. They were the first group to start talking about failures in parts per million, rather than as a percentage, acceptable quality level as a percent. And the Japanese consumers are the same way.

Americans tend to concentrate on the functionality of a product: "Does this thing work?" If the logo's crooked, the manual's missing, or something is not quite right, we tend to overlook that, as long as the functionality is acceptable. In Japan that's not good enough.

Having after-sales service and being committed to the business is very important. Developing distributor relationships is important and has to be worked on. It's a long-term investment, and if you're not ready to stay in for the long haul, then you're better off not getting in at all. American companies need an immediate return. You go in and make an investment somewhere, and three months from now they want to know if you've broken even. And you probably haven't even covered your travel costs yet.

Do you see the latest tariff as being mainly symbolic?

Not just a little. The numbers I have suggest it's only on the elec-

John Rossi, Blue Chip Electronics:

"I can understand what Congress and Reagan are doing, trying to force the Japanese to be a little more open in their market. But I also know that American companies don't do a very good job of marketing their products in Japan, in the Japanese style..."

Jan Lewis is a well-known industry analyst and president of the Palo Alto Research Group, a consulting firm for the microcomputer industry. This article has been reprinted with permission from Computer Insider, *PARG's newsletter.*

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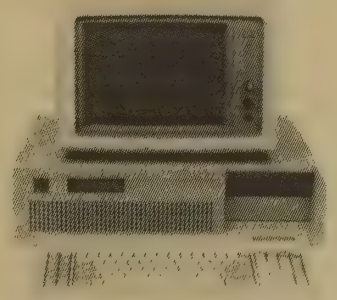

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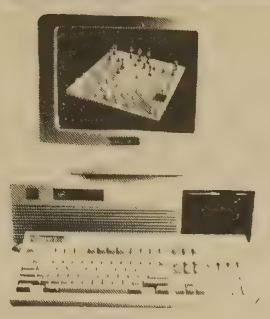

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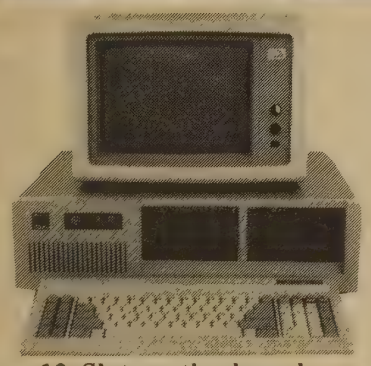

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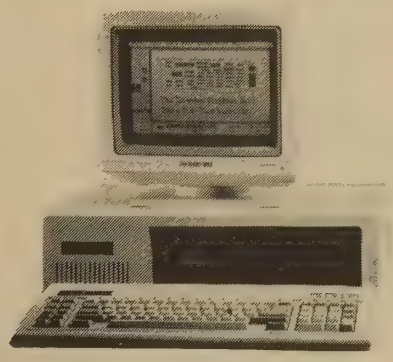

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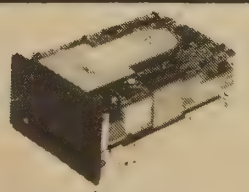

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tronics part, which I don't think is the lion's share of Japanese exports to this country anyway. They're trying to send some kind of message. Obviously, Reagan is against it. His whole political career has been as a fair trader.

That $300 million is a drop in the proverbial bucket.

But I think the other side is the political reality that Congress expected something to be done. And maybe they're trying to send a message to Japan, that they really are serious. But that $300 million is a drop in the proverbial bucket.

* * *

(Leland Strange is the president and chairman of Intelligent Systems Corporation, the Norcross, Georgia, parent company of Quadram, Princeton Graphic Systems, Datavue Computers, Peachtree Software, and Video 7.)

What do you feel the trade sanctions against the Japanese laptop manufacturers will accomplish?

They allow not free competition, but an unfair playing field for the Japanese. We're not ready to bite the bullet and insist that the Japanese become fair. The Japanese are expert at ways around tariffs, as opposed to any meaningful changes in their way of life. They simply are going to find a way to avoid [compliance].

I'm glad we [imposed the tariffs], but they accomplish pretty close to nothing. They're useless in trying to change any kind of long-term behavior on the part of the Japanese, of leveling playing fields. They know all the loopholes, and they know we'll stand on our principles for years before we act. We did it with semiconductors and we're doing it now with laptops. The Japanese are simply putting semiconductors into products.

It's very difficult to build support among end users. The Japanese will encourage consumers to react to anything that will cause prices to go up. They will spend money in justifying the product. They're subsidizing semiconductors.

We really let them do this with TVs. Today they certainly can manufacture a TV and sell it as cheap as anyone, on a fair and level playing field. Back when they were first in this market, TVs were much more expensive, but the Japanese subsidized them and in turn drove the U.S. producers out. And now all you have left are Japanese [TV manufacturers]. So they'll take the short-term loss and not worry about it for the long-term market share. And we've certainly seen that in the microcomputer area.

What do you mean by, "We're not ready to bite the bullet?"

We're patsies. We have a principle. That principle is free trade. And it's very analogous to the Quakers or those pacifists who believe in peace, therefore, you shouldn't have any weapons. Well, we're the same way about trade.

It doesn't matter how many arrows we're getting shot in our back. We'll go down bleeding as long as we can say that we're believers in free trade, we practice what we preach. And the Japanese are laughing at us all the way. I can almost see the Japanese shooting their arrows, with their shields in front of them, and saying, "Free trade, free trade."

You've said that you believe the tariffs were directed against NEC and Toshiba.

It's clear that NEC and Toshiba were the prime culprits under the antigovernment provisions of the latest agreement, so the tariffs were designed to attack NEC and Toshiba without naming them.

They're packaging all the parts of the finished products together and shipping them over here as parts, claiming a certain price (and that price is fair market value — no problem with that), putting them together in the U.S., and then selling them at a price that is fair market value that the semiconductors, with the cost of the promotions and trade advertising, could never justify. So it's another way of dumping.

But we'll never get to them because they're selling the components certainly below the price of what they're selling the product for. They'll absolutely be unprofitable in the U.S., but they make money in the long term by continuing to dominate the market, and they keep their factories running in Japan.

I can almost see the Japanese shooting their arrows and saying, "Free trade, Free trade."

Explain your proposed antitrust suit against NEC.

We have under a consideration a suit against NEC for antitrust action, really the result of the amount of money they're spending promoting a product that ought to be considered a part of the cost of the product.

And interestingly enough, 10 days after someone covered that story [about the proposed suit], NEC raised the price of their laptop computer by $200. They said it had nothing to do with the tariffs. It was strictly due to the change in yen, which in fact is true. What it means is they should have raised their price a long time ago. And not only that, but they saw someone saying they might take some action. Even though I realized how fruitless [the court action] probably was, I wanted to express frustration at something that I knew was wrong. □

Commentary

Forget Pearl Harbor. Remember Detroit.

Right now, the hottest topic is the new tariffs on Japanese goods. The comment one hears most often is, "I'm in favor of free trade, but...." But the Japanese must be taught a lesson; but the Japanese are violating the trade agreement; but the Japanese are dumping, undercutting, selling below cost; but the Japanese are keeping us out of their markets.

This last complaint is voiced so often that it sometimes seems that

In honest company, these practices would be called price-fixing, not fair trade.

America's real beef with the Japanese is not an objection to their dumping, but a whine at being kept out of Japanese markets. Yet practically all observers have the same thing to say: Most Americans do not know how to do business in Japan, and they will not take the trouble to learn.

Certainly it can be done. When BMW decided it wanted into the Japanese auto markets, it proceeded to acquire Japanese auto distributorships and Japanese personnel to run them. Within two years, BMW had become the most popular imported auto in Japan. Its market share now amounts to about 5 percent of the Japanese auto market — a success achieved by combining high-quality products with a commitment to doing business Japanese-style.

Furthermore, it is unclear if the accusations about Japanese trade barriers are entirely accurate. According to a recent article in *Newsweek* (April 13, 1987, "The Myths of a Trade War"), the Japanese spent just slightly less of their income on American goods than Americans did on Japanese goods — 1.7 percent versus 1.8 percent, respectively. In addition, the U.S.-Japan trade imbalance can be misleading. Consider that sales of U.S. subsidiaries operating in Japan are four times larger than the U.S. trade deficit with Japan. Yet they are considered Japanese companies.

As for dumping, I wonder if "dumping" is not just a dirty word for a time-honored practice: the loss leader or promotion. Some observers note that the Japanese undersell competitors until they have driven all competition out of the market, and then jack up prices again. But is that really what has happened? Once the Japanese "owned" the TV market, prices did not soar. They continued their downward trend. And now, manufacturers from Korea, Taiwan, Singapore, and Hong Kong are jumping into this market — just as they jumped into watches, calculators, and microwave ovens — and as they doubtless will jump into semiconductors, laptop computers, printers, and disk drives. And the beneficiary of all this competition is the consumer.

Tariffs and quotas operate against the consumer by raising prices. In honest company, these practices would be called price-fixing, not fair trade. When less expensive foreign goods are made more expensive by tariffs, domestic manufacturers have no incentive to compete. Why should they, when they are being subsidized by the consumer?

Here, the story can take some interesting twists. The tariff may ultimately be self-defeating. The consumer may decide to do without, causing a recession in domestic industry. Or U.S. manufacturers may shift more of their production overseas. After all, American electronics

I wonder if "dumping" is not just a dirty word for a time-honored practice: the loss leader or promotion.

manufacturers have not hesitated to take manufacturing operations offshore to Mexico, Taiwain, India, etc., in order to cut costs. If cheaply produced foreign goods are costing Americans their jobs, can we place the blame entirely on foreigners?

Recent history of American industry is one of complacency and slothfulness. The U.S. auto industry failed to modernize its assembly lines, let quality slip, and refused to recognize changes in consumer tastes. The results were disastrous. The American steel industry avoided plant modernization for decades by hiding behind import tariffs. Now it is a "sunset" industry.

It was feared that automation would create widespread unemployment in the steel towns of the Midwest. Ironically, the high cost of American steel, along with the declining U.S. auto markets, has produced the same results — the "rust belt." Whether the U.S. wishes to acknowledge it or not, the Japanese may have a lot less to do with our trade problems than we do. □

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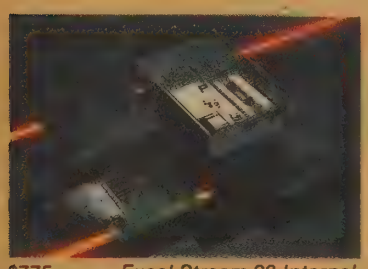

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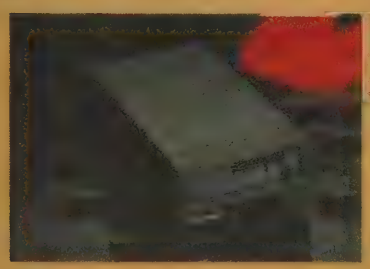

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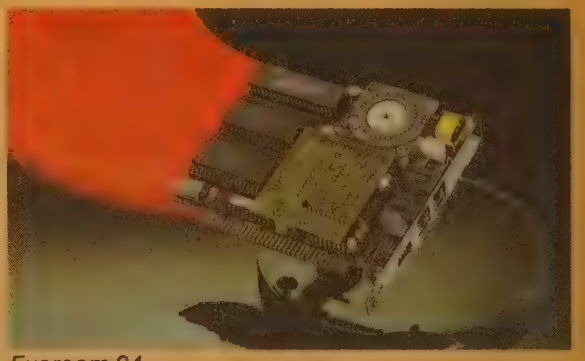

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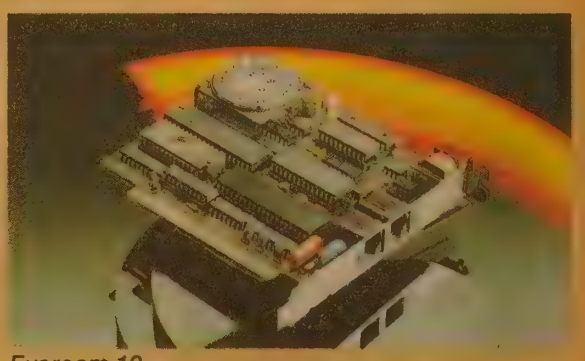

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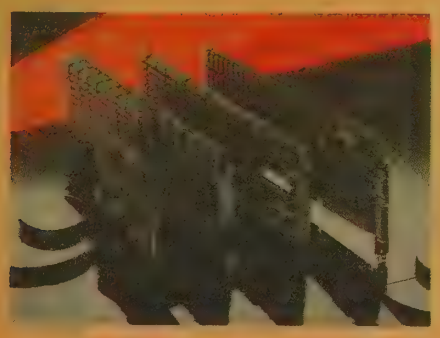

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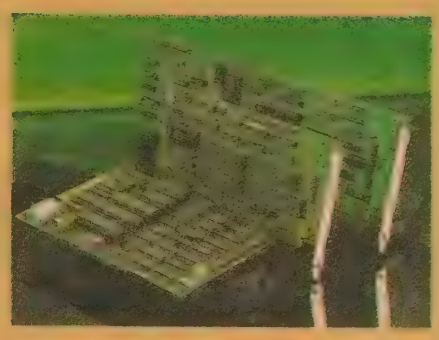

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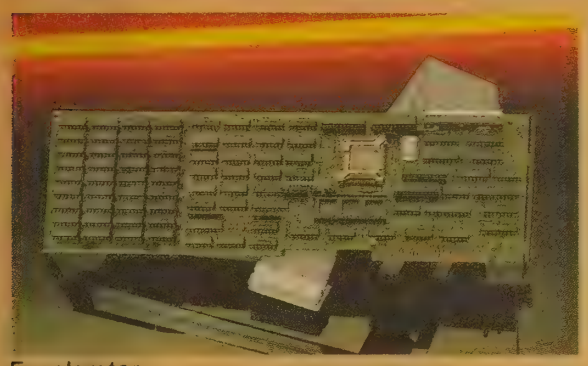

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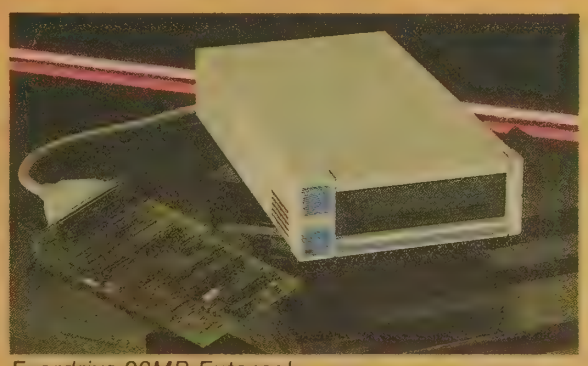

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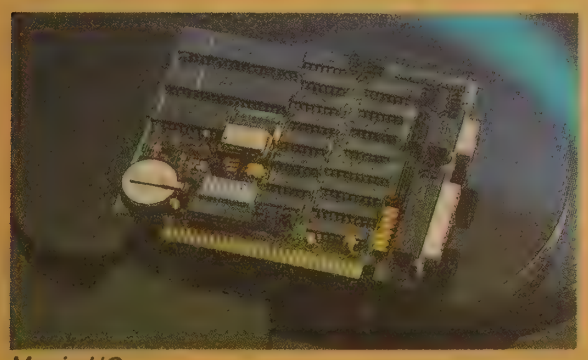

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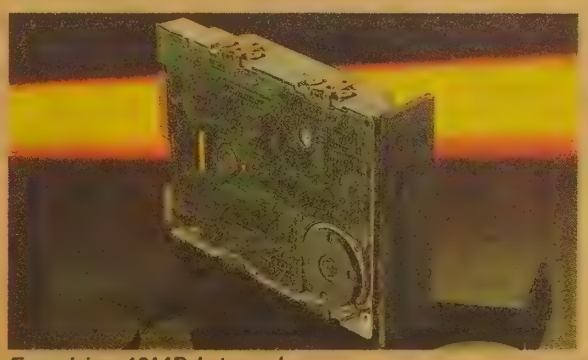

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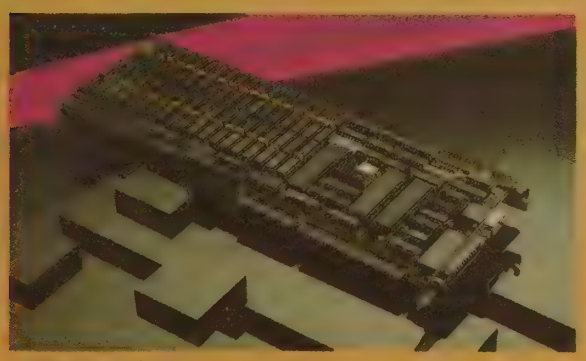

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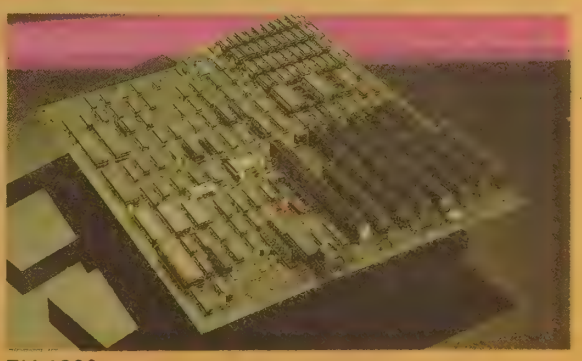

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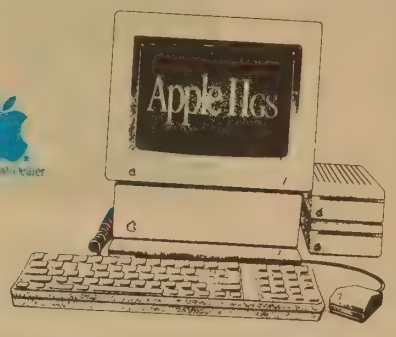

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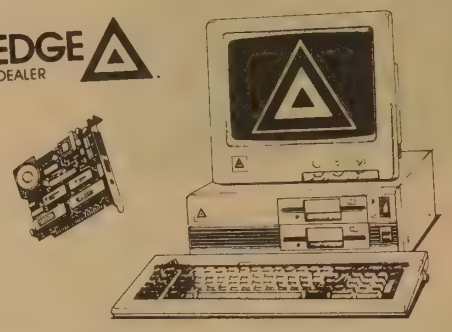

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July 10 Local Area Networks Seminar. Call MIP Computer & Communication Systems, Inc., (408) 738-8578 for information.

July 10 Real Estate Management And Accounting Computer Seminar. Businessland, 465 California Street, San Francisco. Call Howard M. Haberman Associates, Inc. (415) 641-0850 for information.

July 11 Bay Area Computer Swap. Cow Palace, San Francisco. Call Microshows (800) 433-7469 for information.

July 11 Desktop Publishing Technical Seminar. Call MIP Computer & Communication Systems, Inc., (408) 738-8578 for information.

July 11 DeAnza College Computer Mart. 21250 Stevens Creek Blvd. Cupertino. Call the Special Events Office at (408) 996-4350 for information.

July 11-12 DataFlex Advanced Topics Seminar. Presented by Cochlin Computer Systems. (415) 495-5999.

July 11-12 Online Searching Course. San Francisco. Call UC Berkeley Extension at (415) 642-4271 for more information.

July 14 The Use Of Videodiscs For Exhibits. Far West Regional Laboratories, 15th and Folsom, San Francisco. Call the International Interactive Communications Society at (415) 328-7318 for information.

July 18 Local Area Networks Seminar. Call MIP Computer & Communication Systems, Inc., (408) 738-8578 for information.

July 18 Sacramento Computer Show. Cal Expo. Call Golden Gate Shows (415) 388-8893 for information.

July 20 Courses For Computer Scientists And Engineers Begin. Santa Cruz. Contact University of California Extension, Santa Cruz at (408) 429-4985 for more information.

July 23-24 DataFlex Seminar—Level II. Presented by Cochlin Computer Systems. (415) 495-5999.

July 25 Marin Computer Show. Marin Civic Center Exhibit Hall. Call Golden Gate Shows (415) 388-8893 for information.

July 25 Seattle Computer Show. Seattle Center-Flag Pavilion. Call Golden Gate Shows (415) 388-8893 for information.

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August 1 Bay Area Computer Swap. Cow Palace, San Francisco. Call Microshows (800) 433-7469 for information.

August 4-7 Effective Skills For Technical Managers. San Francisco. Contact Integrated Computer Systems (800) 421-8166.

August 6 Buying Your Desktop Publishing Hardware And Software. Call the Software Training Group, (415) 397-4158 for information.

August 6 Multi-User Accounting Seminar. Call MIP Computer & Communication Systems, Inc., (408) 738-8578 for information.

August 8 Computer Mart. De Anza College Campus Center, Cupertino. Call Call (408) 996-4350. Call Golden Gate Shows (415) 388-8893 for information

August 8 Vallejo Computer Show. Solano County Fairgrounds. Call Golden Gate Shows (415) 388-8893 for information.

August 10-14 Computer Graphics Intensive Short Course. Sunnyvale. Call (415) 642-4151 for information.

August 11-14 Knowledge Based Systems And Artificial Intelligence. Palo Alto. Contact Integrated Computer Systems (800) 421-8166.

August 11-14 Structured Design And Programming. San Francisco. Contact Integrated Computer Systems (800) 421-8166.

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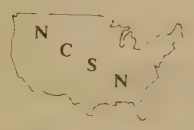

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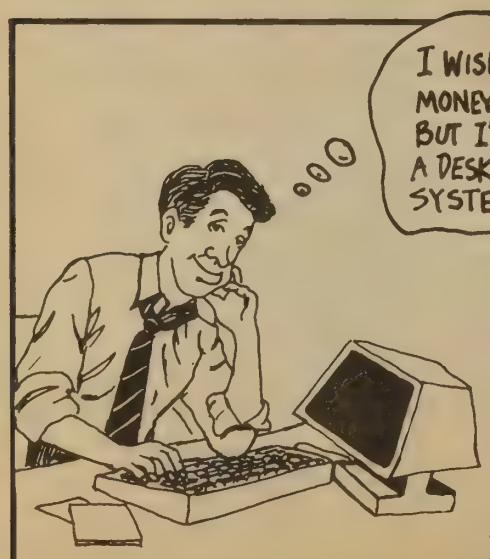

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August 18-21 LISP And LISP Environments: Hands-On AI Workshop. Palo Alto. Contact Integrated Computer Systems (800) 421-8166.

August 22 Multi-User Accounting Seminar. Call MIP Computer & Communication Systems, Inc., (408) 738-8578 for information.

August 25-28 Fiber Optic Communications. San Francisco. Contact Integrated Computer Systems (800) 421-8166.

September 9-12 The Desktop Publishing Conference. Santa Clara Convention Center, Santa Clara. Call Seybold Seminars (213) 457-5850 for information.

September 15-18 Communication Systems Design. Palo Alto. Contact Integrated Computer Systems (800) 421-8166.

September 20-25 Hewlett-Packard Business Computer Users Conference. Las Vegas, Nevada. Contact INTEREX at (408) 738-4848 for information.

September 22-25 Designing Modern Software/ User Interfaces. Palo Alto. Contact Integrated Computer Systems (800) 421-8166.

September 22-25 Integrated Voice/Data Communications And ISDN. Palo Alto. Contact Integrated Computer Systems (800) 421-8166.

October 5-9 Bourne Shell And C Programming, System Administration And UNIX Classes. Hyatt House, Palo Alto. For more information contact Berkeley Decision/Systems at (408) 458-0500.

October 16-17 Eighth Annual Fall Computer Using Educators Conference. Hyatt San Jose and Independence High School San Jose. Contact CUE at (415) 328-2248 for more information.

October 20-23 PC-Based Tools For Software Analysis And Design. Palo Alto. Contact Integrated Computer Systems (800) 421-8166.

October 20-23 Machine Vision And Image Recognition. Palo Alto. Contact Integrated Computer Systems (800) 421-8166.

November 19-20 Eleventh Annual Western Educational Computing Conference. San Francisco Cathedral Hill Hotel. Contact Alexia Devlin, CECC Treasurer, San Francisco State University, Accounting Data, NADAM-358, 1600 Holloway Ave., San Francisco, CA 94132.

As a community service, MicroTimes lists trade shows, seminars, and other special events in the Calendar of Events free of charge on a space-available basis. To improve the likelihood of your listing's timely inclusion, please make sure we have the necessary information no later than the first of the month two months before the cover date of the issue in which you'd like it to appear (i.e. the deadline for the December issue, on the street in November, is October 1). Send to: MicroTimes Calendar of Events, 5951 Canning St., Oakland, CA 94609.

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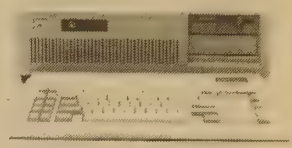

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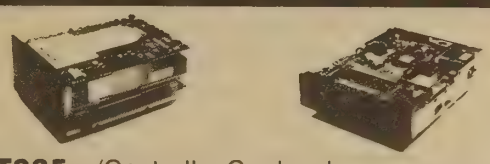

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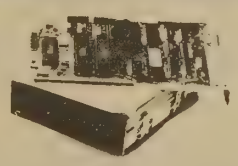

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NEWSBYTES™

BY WENDY WOODS

Mac II Ships; Quantities Limited – IBM Claims Booming PS/2 Sales

Macintosh II—Three Models Per Dealer

CUPERTINO, CA (NB)—By now, you should be able to walk past every authorized Macintosh II dealer's shop window and see three of the models, based on Apple's current plans. While rumors persist that the Mac II production is hampered by parts shortages and component failures, Apple is making sure the cream of the crop goes to its dealer network for an advanced promotional blitz, according to *MacWeek*. Some 800 dealers have qualified to sell Apple's top-of-the-line model. But even though the machines are on display, quantities won't be for sale for at least three months, according to Godfrey Sullivan, head of Apple's dealer sales unit.

Fix For SE Hard Disk Bugs

CUPERTINO, CA (NB)—Some owners of Macintosh SEs with internal hard drives have had one problem after another. First, the set-up program refused to recognize the hard drive's existence. So Apple offered owners a patch program. That worked fine until some users began to experience the slightly annoying problem of disappearing data. Now, with the third try hopefully the charm, Apple says the problem is fixed with a new set-up program, version 1.4, which you can get from an authorized Apple dealer. Most of the affected machines have serial numbers that start with F721, F722, and F723.

Mac Add-On From National Semiconductor

SANTA CLARA, CA (NB)—For the first time in its history, National Semiconductor has entered the market for PC add-ons by offering a 16-megabyte memory board for Apple's new Macintosh II. The board is capable of running both UNIX and Macintosh software, will be for sale in July, and will cost $7,000. The NSB/16 will also come with National Semi's RAMdisk software that enables the computer to access the 16 megabytes of RAM as if it were a disk in a disk drive. Says National spokesman Dave Jorgensen, the NSB/16 "is an opportunity to apply our extensive experience to the high-level personal computer market." The board will also be available in lesser configurations of 4, 8, or 12 megabytes at a cost of $400 per megabyte.

IBM Offers Connections To The Non-IBM World

ATLANTA, GA (NB)—IBM's recent announcements of new products and improvements in its NetView communications offering are all designed to let IBM mainframe users pass data to and from non-IBM equipment more easily. They're an admission that, regardless of what Big Blue thinks, its "fair share" of the computer-communications market will never get close to 100%. (IBM still holds over 70% of the mainframe market.)

IBM 9370 processors will now be able to talk easily with IBM Token-Ring networks, or any terminals in them. IBM announced new support for the LU 6.2 protocol, and said future pieces of its Systems Application Architecture (SAA) will be based on it. IBM said its X.25 protocol will now support the TCP/IP system used by government, universities, and competitors. For fast (1.544

U.S. stories in Newsbytes are compiled by Wendy Woods, Ken Maize, and Dana Blankenhorn. Masayuki Miyazawa and Keizo Yamamoto compile the Japanese reports in Tokyo. Send all comments and newstips to Wendy Woods, Editor in Chief, NEWSBYTES, 39 Miramar, San Francisco, California 94112 or call 415-587-6389. Copyright ©1987

Wendy Woods Brings Newsbytes To MicroTimes

Wendy Woods, a syndicated editor and on-line columnist published nationally and internationally, calls the computer industry "the most fun I've ever had in journalism." Beginning this issue, *MicroTimes* is pleased to announce the regular publication of her nationally renowned computer information service, Newsbytes™. If it's possible to have fun being serious, Woods achieves this in Newsbytes.

Woods began her computer career in 1982 in the midst of a television journalism career, covering assignments in Silicon Valley for the Cable News Network and San Francisco's KGO. "I felt like a fish out of water," says Woods, "I didn't even know what a hard drive was." So Woods bought herself an Apple IIe and began to teach herself on the computer. And, like so many of us, she got hooked. In 1983 she discovered online services and became a member of The Source and CompuServe. When her bills began exceeding $400 a month, she decided she'd better make this computer hobby pay for itself. It was then that the idea of Newsbytes came to her.

At this time The Source offered what it called "Member publishing," which allowed subscribers to send in their articles and receive royalties based on readership. While searching online for computer news, Woods conceived the idea of creating a news column with the top 15 or 20 stories of the week. Using the wire services, newspapers, and her own journalism contacts, Woods designed Newsbytes as an assignment sheet for other reporters — a "poop sheet" as it is known in the industry. "I was basically moonlighting," Woods remarks. "I didn't have a real job in the computer industry ... I was doing this to pay my Source bills!"

Nevertheless it worked, and worked well. In 1984, ready for a career change and wanting to leave television journalism, Woods decided to make Newsbytes a business. Soon she began editing stories sent in by other reporters and became syndicated outside of California. In 1985 The Source made Newsbytes an actual service for readers, the first—and thus far only—member publication to be turned into a regular feature by them. As a Source service, Newsbytes stands next to the Universal Press Information, the Associated Press and the Washington *Post*.

Newsbytes as a whole consists of fourteen features on a weekly basis, with eight regular contributors and five to six intermittent contributors. All the writers have an individual style, but they are patterned after Woods' own approach, "a more conversational style ... it began as more of a TV style." Woods attributes Newsbytes' longevity to its low overhead (all communications take place electronically) and to the dedication of its staff. "It is important for us to compile a succinct, accurate portrait of what's happening in the computer industry in our area," says Woods. And this means fast, easy news to its many readers.

Today Newsbytes is syndicated in Canada, Japan, and the United Kingdom as well as throughout the U.S. In addition to Newsbytes West, which Woods writes herself, there is now also Newsbytes East and Newsbytes South. These are written by individual readers who wanted local versions, then sent electronically to Woods who edits them and gets them in print. Woods estimates that the writers churn out over 29,000 words a week, which surpasses any weekly tabloids, magazines or newspapers. Newsbytes is read by hundreds of thousands of readers each week, through online bulletin boards, regional systems and publications such as *MicroTimes*. In Japan, Newsbytes West is published by *I/O* magazine which alone has a circulation of over 200,000.

Other publications which print Newsbytes include *St. Louis Computing*, *The Inputter*, and *Bits And Bytes* in New Zealand. Its online services include a European based service, Telestarr in Japan and around ten publicly accessed bulletin board systems in the United States. Newsbytes' readers come from such diverse places as Costa Rica, Japan, and Germany.

In 1985 Newsbytes won the "Best Online Publication Award" at the Computer Press Association. Because Woods became president of the CPA last year, she chose not to enter Newsbytes a second time. Woods is also a correspondent for the *Computer Chronicles* on PBS, aired locally on KCSN.

As to the new publication in *MicroTimes*, Woods emphasizes that "*MicroTimes* will be our most important publication to date because it will publish in print most of the columns." In the future, Woods would like to see Newsbytes expand into even more printed publications.

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megabit/sec.) T-1 lines, IBM's new product offering is someone else's product—the IDNX family of T-1 boxes from Network Equipment Technologies Corp. New terminals, controllers, and software products were also announced.

As quietly as it can, IBM is learning to live in a computing-communications world it did not make, and cannot fully control.

In a rare published interview, International Business Machines Chairman John Akers says Big Blue is "not easy enough" to do business with. In an interview in *Information Week*, Akers said, "I think we have over the years developed a conservatism that is not as useful to us as another approach might be." Sounds like he's been listening to IBM customers. IBM has declared 1987 the "Year of the Customer," after being shaken to the roots last year by a two-year drop in profits.

PS/2 Sales Booming, Says Bill Lowe

NEW YORK (NB)—"We shipped 250,000 PS/2 units as of yesterday," IBM's Bill Lowe, in charge of personal computers, told securities analysts in mid-June. "Our production people are working flat out to meet demand, and we are continuing to ramp up production on the PS/2. We are ending every week with essentially no finished goods inventory."

Lowe was appearing before the group to scotch rumors that demand for the new machines has been slow and work on the new OS/2 operating system has been experiencing delays. Lowe said that 50 copies of OS/2 are in the hands of early developers. "We had said OS/2 would be available by the first quarter of 1988. People will have it then, or sooner," he said.

Compaq Cuts Prices, Adds Disk Caching

HOUSTON, TX (NB)—The Compaq standard rolls merrily on, and the Compaq Ranch acts more and more like Big Blue. (Maybe we should call them Big Gray.) While the rest of the world was nibbling canapes at COMDEX and watching the IBM floor show, Compaq was quietly cutting prices on its old machines by $300-500, putting more cost pressure on "Compaq-clone" makers. You should now be able to get a Compaq Portable II Model 4, with its 80286 chip, for under $4,000 retail.

The disk caching utility will become standard on new Compaq models, including the Deskpro 386. It will work with EMS boards which break the old 640K barrier. Caching can improve hard disk performance up to 50% when you're using disk-intensive programs like databases or spreadsheets. Older Compaq users can get the new software from their local Compaq dealers.
CONTACT: Jeff Stives, COMPAQ, (713) 370-0670

Lotus Shifts Top Management

CAMBRIDGE, MA (NB)—Lotus Development Co. has quietly reorganized its top management in a move that some industry insiders speculate may be related to persistent rumors that Lotus chief Jim Manzi is leaving the company. Under the new structure, Charles Digate, 34, will be a senior vice president with responsibility for all software products. He was senior vice president, international and information services. Daniel McMillian, who had been senior VP, software products, will become president of Lotus Publishing Corp., a Lotus subsidiary that he has headed in the past. Lotus denies reports that the move puts Digate in line to become president of Lotus. Manzi, 35, is chairman, president and CEO of Lotus.

Toshiba—Good News, Bad News

SANTA CLARA, CA (NB)—No sooner has the scandal regarding Toshiba's alleged sale of electronics to the Soviets, and a report of the firm's exclusion from any new U.S. contracts made headlines, but it is back in the news again, this time accused of copying National Semiconductor's UART, or universal, asynchronous receiver-transmitter devices. These are the chips which enable a PC to communicate with peripheral devices, and are found in nearly every IBM and IBM-compatible computer. At stake are millions of dollars National Semi makes from this lucrative business. National Semi and Toshiba hope to resolve this matter before it reaches the courts. Toshiba has stated the chips are "similar" but are not duplicates. Reports indicate Toshiba had been buying large quantities of the UARTs from National Semi until recently, when orders suddenly dropped.

Meanwhile, production of Toshiba's popular 16-bit T1100 and T3100 laptops is in full force at Toshiba's Southern California manufacturing plant, and the first U.S.-made units are expected to reach store shelves by the end of July. Toshiba switched production of the best-seller to America after President Reagan imposed a 100% tariff on Japanese-made 16-bit computers. The laptops are still in demand but hard to find. The Bay Area's biggest electronics store, Fry's Electronics in San Jose, says the T1100 models are sold out and the T3100s—hard disk versions—are in short supply.

Information Industry To Fight Access Fees

WASHINGTON (NB)—Look for heavy lobbying and a tough battle from computer information services in the wake of the Federal Communications Commission proposal to change telephone access charges. Information industry officials have already met staff of the House Energy and Commerce Committee's telecommunications subcommittee. The subcommittee chairman is Rep. Edward Markey (D-MA), whose Boston district includes important computer and telecommunications firms.

Gerard Salemme, a subcommittee staffer, told the Associated Press, "We're still analyzing what effects it would have on the information service markets. Developing those markets has long been a goal of this Congress and the FCC." Telenet vice president Philip Walker told the wire service that the access fees "would be a serious setback for the whole information industry. What you would see is a reduction in demand for all services, but dramatic reduction in demand almost to the point of killing ... the low-priced services."

Electronics Deficit Narrows

SANTA CLARA, CA (NB)—The dire predictions of just a few months ago, during the height of U.S.-Japan trade friction, suddenly are not holding as much weight. That's because the American Electronics Association has just issued new figures that shows the U.S. electronics trade deficit with the world and Japan has narrowed 12% in just three months. The deficit with Japan now stands at $4.6 billion, a 12% drop over January's figures, and the U.S.'s worldwide deficit is down to $2.5 billion, a 19% drop. That's good news, but the AEA's Ralph Thomson, senior vice president, warns against opening the champagne prematurely. "Second quarter figures available late this summer will confirm if a significant trend reversing our trade deficits is underway."
CONTACT: AEA, 408/987-4232

FCC Actions Hasten Need For 9600 Baud Standards

NORCROSS, GA (NB)—The Federal Communications Commission decision to make online users pay up to $5 more per hour to local phone companies for access to packet switching services

Egghead Discount Software's Annual Software Eggzibition

The Seattle-based chain of computer software stores, Egghead Software, is holding its third annual Software Eggzibition at the Santa Clara Convention Center on July 10th, 11th and 12th.

Egghead has brought together 64 manufacturers under one roof to demonstrate their best selling software and accessories. Egghead will be selling the products at special low prices throughout the show.

Over 100, 000 people attended last year's show, and at least that many are expected to turn out this year to see such software manufactures as Ashton-Tate, Borland, DataEase, Front Runner, Lotus, Migent, Quarterdeck and WordPerfect.

Admission to the show is free, and Egghead is encouraging parents to bring their children. There will be personal appearances by Professor Egghead and Carmen Sandiego of Brøderbund Software fame.

The keynote address will be delivered by Bill Gates, chairman and co-founder of Microsoft Corporation.

Along with the manufacturer's demonstrations, there will be product seminars offered throughout the event. These product seminars include Spinnaker's *One Minute Manager*, Paperback Software's *VP* Series and Electronic Art's *Chuck Yeagers's Advanced Flight Simulator.*

All demonstrated products will be available for purchase, including some products that will be available for the first time at the show. The Egghead Show Store will have a $1 million inventory of best-selling software. Prices will be cut up to 50%. All kinds of software will be available, including business, education and entertainment products.

Each day of the show, Eggzibition attendees will be eligible for a $1,000 shopping spree. $50,000 worth of software will also be given away in hourly drawings over the course of the three-day event. There will be free T-shirts and posters available.

The Egghead Eggzibition will be held Friday, July 10 from 10:00 am to 8:00 pm, Saturday, July 11 from 10:00 am to 8:00 pm and Sunday, July 12 from 10:00 am to 6:00 pm.

The Santa Clara Convention Center is located at 5001 Great America Parkway in Santa Clara, at the corner of Tasman Avenue and the Great America Parkway. From Highway 101, take the Bowers/Great America exit north. The center is past Great America and is located next to the Doubletree Hotel. Parking is available from both the Great America Parkway and Tasman Avenue. The Convention Center's parking garage is directly adjacent to the center. For further information call Janice Jencarelli, (206) 486-7337, extension 258.

—Robert Beauchamp

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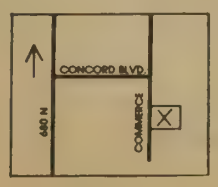

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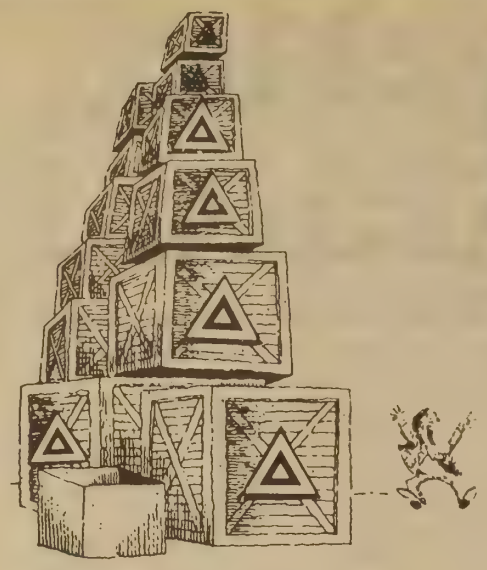

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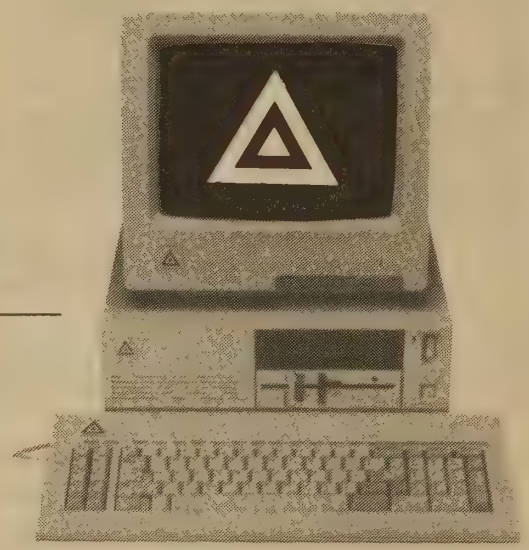

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like Telenet should jump-start the new market for 9600 baud modems. Trouble is, while the "Hayes standard" makes 1200 baud connections easy, the company's 9600 baud products are just now reaching the market.

Worse, the new Hayes "V-Series" is not fully compatible with the V.32 specifications presently in front of standards-making bodies. A Hayes spokesman indicated fully meeting the V.32 specs in full duplex would make 9600 modems too expensive. Hayes used most of it, but in half-duplex, with Hayes firmware implementing something it calls Fast Turnaround Ping Pong.
CONTACT: Sharon O'Brien, HAYES, (404)449-8791

Multiuser Databases Without Limits

JACKSONVILLE, FL (NB)—Folks who think of replacing mainframes with micros quickly run up against the fact that, as files get bigger and more complicated, micros quickly slow down. George Treiber of Unlimited Processing Inc. says he has a solution.

Top Drawer, a 140K file manager written in Pascal and assembly language, can quickly and easily handle files residing on more than one file server, finding one record in 65,000 in .06 seconds. It manages a distributed database program called *Team-Up*.

At a demonstration off the Spring COMDEX show floor early this month, Treiber said *Top Drawer* has drivers for all popular word processors, it can know about 32,000 files at once, and each of those files could have four billion records. It uses query-by-example and wild cards, so you don't have to know exactly what you're looking for to find it. Treiber's demo featured Compaq and IBM machines running Novell NetWare with Omninet boards. In the demo, the results of highly complex searches were displayed instantly, multiuser file locking worked great, and so did horizontal group security, a system that lets accountants and salesmen use the same system without seeing each others' work. *Team-Up* is pricey—$795 for a one-user package, $1,795 for a 10-node package, and $100 more for each additional node over 10. But it doesn't seem hard to learn, it does seem well-behaved, and it might just have been the neatest unknown thing at the show.
CONTACT: George Treiber, UNLIMITED PROCESSING INC., (904)262-2068

DEC Slashes Workstation Prices

MAYNARD, MA (NB)—In a bid to increase its market share, Digital Equipment Corp., last week slashed prices on its computer workstations. The move put DEC in the strange position of price leader in a market where it has not done very well.

The move by Digital is aimed at blunting the strong sales of Sun Microsystems of Mountain View, Calif., and Apollo Computer Corp., of Chelmsford, Mass, according to analysts. The move will also position Digital to take on the high-end of the new IBM line of personal computers.

"I was flabbergasted," John Logan of the Yankee Group in Boston told the *Wall Street Journal*. "They have announced the Apollo-killer and laid the groundwork for competing with [IBM's] PS/2." DEC's new monochrome workstation will debut in December at $4,600. The existing VAXstation 2000 with a 19-inch mono monitor will go from $5,400, down from the current $10,500. A color VAXstation 2000 will sell for $7,900.

Apple Laptop Nearer?

CUPERTINO, CA (NB)—Apple is currently evaluating liquid crystal display screens for laptop

versions for a Motorola 68000-based portable Macintosh code-named Malibu, according to *PC Week*'s Jim Forbes. The report, the most detailed yet on the unannounced machines, says two versions of the portable Macs are in development—a low-end one megabyte memory unit with SCSI and mouse ports, and a version with floppy disk drives and a 20 megabyte hard disk with an optional electroluminescent display. Rumors of the portables have been circulating for years, but the din has increased considerably recently.

The screen most likely to succeed, according to the report, is called the Active Matrix LCD, which has a very high contrast display, roughly twice that of the popular supertwist technology. The machines are expected to retail for around $2,500, if they reach the market. As expected, an Apple spokeswoman had no comment on the report.

Macintosh Juggler Will Force Software Re-Writes

PALO ALTO, CA (NB)—Speaking before the Software Entrepreneurs' Forum last month, former Macintosh team member Andy Hertzfeld said Apple's coming multitasking operating system, called Juggler, will not be able to "juggle" existing Macintosh applications unless they are modified. He said Apple could have opted for a Juggler which could enable several programs to run at once on existing Macintoshes, but chose not to, a fact which he says "is unfortunate for users." Apple showed Juggler at a software developers conference in April and has announced it will be released in late summer or early fall. If Hertzfeld's comments are true (he's known for his credibility), there are expected to be very few balls available when the Juggler makes his debut.

Improved Appleshare Due Next Month

CUPERTINO, CA (NB)—Within six months of its introduction, *Appleshare*, Apple's file server software, will have it first upgrade available in July, designed for use on the Macintosh SE and II. Apple officials deny the issue of Version 1.1 is due to reports of system crashes (one happened during the January *Appleshare* news conference), but Apple's desktop communications manager Peter Friedman does say the upgrade "improves the performance of applications running in the foreground on the server."

Hewlett-Packard Readies Macintosh Scanner

PALO ALTO, CA (NB)—Hoping to cash in on the growing market for Macintoshes and the desktop publishing field, Hewlett Packard will introduce its first Macintosh scanner in August or September. The HP ScanJet, currently for HP and IBM compatible workstations, retails for $1,495 and provides a respectable resolution of 300 dots per inch and recognition of 15 different gray shades on a scale. HP also will introduce a page feeder, an interface card to hook the Mac up to the ScanJet, and software to run the system. CONTACT: Dick Harmon, Hewlett Packard, 415/857-4225.

Apple Hit By $1 Billion Lawsuit

REDWOOD CITY, CA (NB)—An LCD design company is suing Apple Computer for $1 billion on

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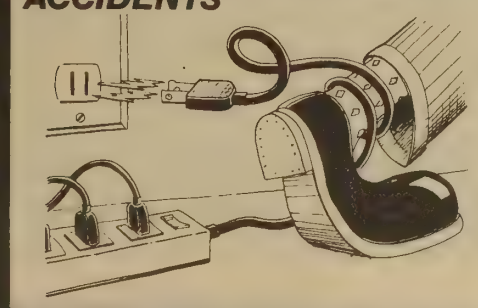

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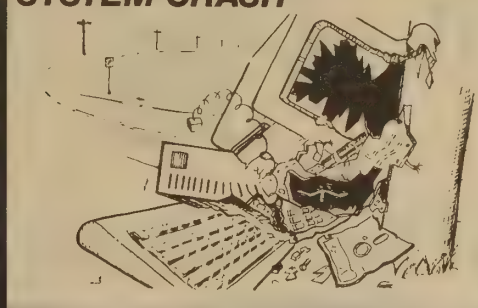

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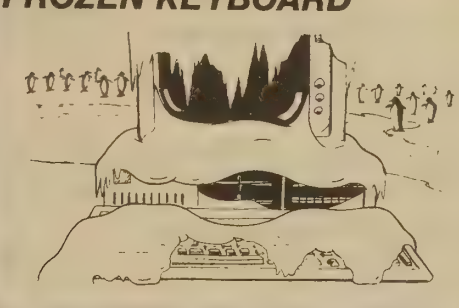

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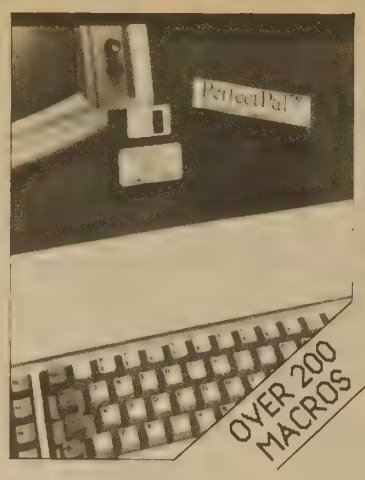

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the grounds that Apple broke a $10 million contract for development of a flat panel computer display screen in 1985. The suit also sheds light on the battle between Steve Jobs and John Sculley, which led to the ouster of the Apple co-founder in 1985.

Woodside Design Associates, which filed the suit in San Mateo County Superior Court, says that Steve Jobs had given oral and written commitments for the screen development, leased space for the company's research facility, dubbed Applelabs, and further had promised that Apple would buy the company. However, following a power struggle between Sculley and Jobs, the agreement was abandoned and Woodside's project forgotten. Woodside Designs President Steven Kitchen was quoted as saying that Jobs met him at his home, directly after the Apple coup, and said Apple had "screwed Woodside Design."

"This was Jobs' deal, and we know what happened to Jobs deals when Sculley won the power struggle," said Woodside attorney James Hennefer to the San Francisco *Examiner*.

Jobs' Next From NeXT Due Next Month?

PALO ALTO, CA (NB)—Calls to NeXT, Steve Jobs' firm, inevitably get you on "the big red hold" button or elicit the usual "no comment." But reporter Denise Caruso has just discovered that the factory where the NeXT computers will be produced is virtually next door to Apple's Macintosh factory in Fremont, California. As Denise aptly puts it, it just goes to show that "no matter where you go, there you are. . . . " A NeXT spokesman would neither confirm or deny a report that the NeXT workstation would be unveiled in Phoenix at Usenix, a Unix user group show, where Jobs is scheduled to be keynote speaker in July. CONTACT: NeXT Inc., 415/424-0200.

Wozniak's Hand-Held Controller Finally Unveiled

LOS GATOS, CA (NB)—The programmable, hand-held master remote control unit called CORE, which Steve Wozniak's firm CL9 has been developing for two years, was finally unveiled at CES in Chicago and will go on sale next month. The $199 controller will accept macros to turn on, off, or make adjustments to, dozens of infrared-activated devices. With the flick of a button, Wozniak himself demonstrated CORE controlling three VCRs, two TVs and a stereo system. If the high price didn't impress anyone, the technology did. CORE won the CES' innovative design and engineering award.

The next task CL9 will undertake is to produce interfaces for CORE and home security, telephone, and lighting systems. CONTACT: CL9, 408/996-9999.

Computerland Finally Sold

OAKLAND, CA (NB)—But it's not over yet. Eighty percent of ComputerLand, the nation's largest franchised computer store operation, has been purchased by New York investment firm E.M. Warburg, Pincus, and Company for an estimated $200 million, but the future of the 800+ store retail chain is by no means settled. The cash goes to ComputerLand founder William Millard, now living somewhere in the South Pacific. Millard, however, is still locked in battle with investment firm Micro/Vest over the remaining 20% stake—approximately $50 million—in Computer-Land, a battle which saw both sides spinning through the revolving doors of the courthouse last year. Millard is appealing a judge's ruling which awarded Micro/Vest that remaining 20% share in an investment dispute.

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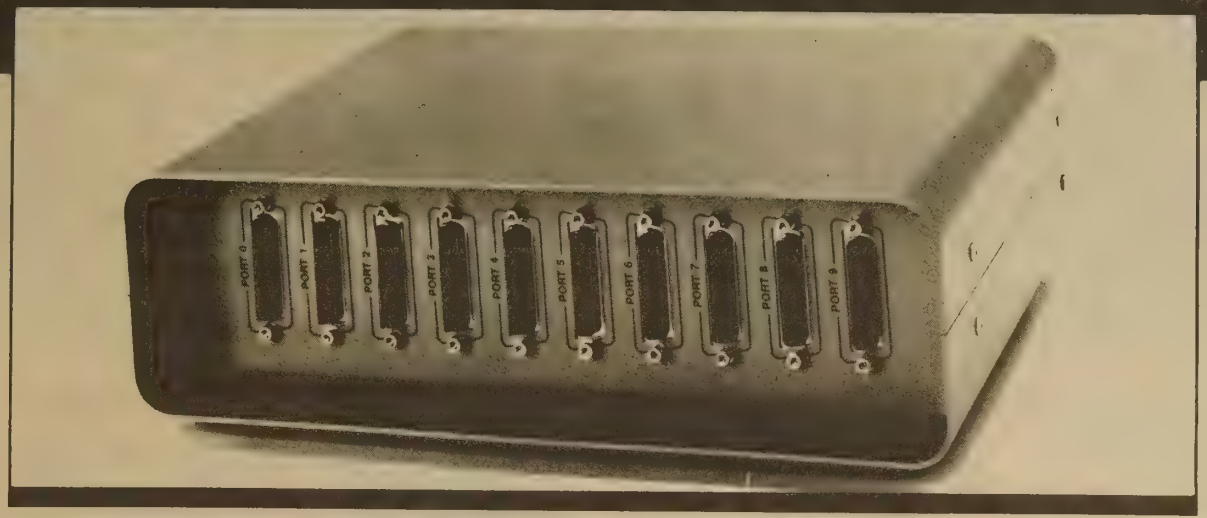

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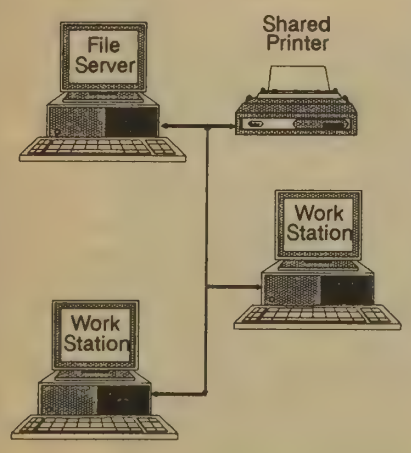

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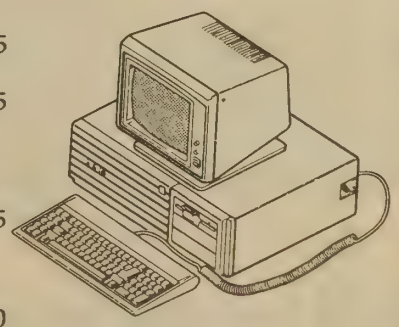

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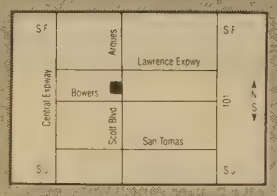

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While a ComputerLand spokeswoman says no changes have been announced, neither has a new head of ComputerLand, and franchisees are waiting for news. The sale is expected to be completed within 90 days. CONTACT: Diane Douglas, ComputerLand, 415/475-3116.

Lining Up For OS/2 Workshops

Seattle, WA (NB)—They're $3,000 a pop, but the tickets are going fast to Microsoft's June and July 3-day OS/2 seminars in Seattle and New York. Software developers are eager to get the information, a copy of OS/2 with debugger and compiler, the documentation (which weighs 75 pounds and spans 2,000 pages) and a year of telephone support from Microsoft software engineers, so some 1,200 at last count are shelling out the steep fee. Why? As Stewart Alsop points out in his *PC Letter*, "OS/2, given IBM's intense support and the system's new capabilities in graphical, multitasking, protected operations, appears to be the only sure opportunity to build truly important new software products for both new and existing companies." He concludes the $3,000 is fair, since a developer could earn upwards of $100,000 with an OS/2-based product.

Iomega's Lawyers Back On The Job

ROY, Utah (NB)—No sooner has it settled a class action lawsuit filed by shareholders than Iomega

IN BRIEF

MICROPRO, San Rafael, CA, says 100,000 copies of *WordStar Professional* Release 4 were shipped in the product's first 100 days. *WordStar* has an installed base of two million users.

KAYPRO, Solana Beach, CA, is the first Intel 80386-based computer manufacturer to cut prices on the industry's newest micros. Kaypro has shaved $500 off the price of three of its 80386-based computers: the Kaypro 386 Model A, the 386 Model E-40, and the Model E-130. Kaypro has also slashed $500 off its EXTRA turnkey desktop publishing system.

TRAVELING SOFTWARE, Bothell, WA, introduced a snap-on memory upgrade for Tandy 100 and 102 portables at COMDEX. The Booster Paks, available now, start at $429 and provide up to 2 megabytes of extra RAM.

SEATTLE, WA travelers can fly easier knowing their city is one of the first in the nation to get a highly sophisticated new computer system to assist air traffic controllers. The hardware reportedly works ten times faster than most air traffic control computers, alerts workers to potential mid-air collisions, and keeps track of the distance between planes.

WYSE TECHNOLOGY, San Jose, CA, has purchased Link Technologies of Fremont. Both are terminal manufacturers. The sale price was not disclosed.

MICROSOFT has bought a $1 million chunk of Natural Language Inc., a Berkeley-based producer of, right, natural language-processing software. Microsoft gets the rights to develop and incorporate into Microsoft products NLI's natural language technology.

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Corporation was sued again—this time by the formidable Eastman Kodak. Rochester, NY-based Kodak claims Iomega failed to honor a three year agreement in which Kodak was to supply head coupler assemblies for Iomega's Bernoulli Box disk drives. Kodak was to receive a regular schedule of purchase orders, but claims Iomega slacked off in demand for the assemblies, and didn't pay its bills—amounting to nearly $1 million dollars. Iomega spokespeople will not comment on this suit. in which Kodak seeks $7 million in fees and damages.

Firm Says Software Caused Embezzlement, Big Losses

IRVINE, CA (NB)—Pertec Computer Corporation of this city is in big trouble with a former customer who says Pertec's software enabled an employee to steal $102,000 and further, cost the company $718,000 in business. The nasty battle, initiated by Cooperative Developers of Lenexa, Kansas, is over Pertec's modification of an accounts receivable program owned by Cooperative Developers, a.k.a. CDIJ Flooring and Interiors. CDI says Pertec's modifications enabled a former clerk to divert funds to his own account, then erase all the files. CDIJ says the fiasco has caused it to lose the $718,000, so it is seeking this amount, and punitive damages, in a lawsuit against Pertec.

NEWSBYTES SOUTH

Compaq Clarifies Stand On OS/2, Promises Support For It and DOS

HOUSTON, TX (NB)—Compaq, which neither bought a booth nor threw a party at last week's COMDEX, still made news by announcing it will support OS/2, the announced operating system of the IBM PS/2 line. The statement by president Rod Canion was headlined "The Myth of OS/2-PS/2 Linkage," calling OS/2 Microsoft's new operating system "designed to be compatible with all 80286/386 systems." Preliminary releases of OS/2, he added, have worked very well on Compaq PCs. The only version worth worrying about is OS/2, Extended Edition, which bundles IBM-made database and communications with the Microsoft-made OS/2. Canion said "users will have the choice of using either standard OS/2 or an extended version. Our plan is to ensure that comparable extensions are available with OS/2 for Compaq customers."

RESULT: Compaq will ship its own Compaq Support Kit to software developers, with goodies like enhanced disk partitioning and a protected mode version of Compaq's hard disk back-up utility. Compaq will also keep supporting MS-DOS, which Canion said is still due for "many future DOS 3.x upgrades" from Microsoft. TRANSLATION: This town's plenty big for the both of us, pardner. CONTACT: Jeff Stives, Compaq, 713/370-0670.

Gulfstream Micro Systems To Be Bought By DEST

BOCA RATON, FL (NB)—Gulfstream Micro Systems Inc. agreed to be bought out by DEST Corp., Milpitas, CA. DEST makes scanner systems. According to DEST, it was Gulfstream's EZ-Fax board, which lets PCs and compatibles pass files with digital facsimile machines, which made the buy-out attractive. DEST quoted CAP International as saying that facsimile revenues in 1987 will reach

Desktop Publishing Overblown?

TEMPE, AZ (NB)—Media hype—that's what researchers call the desktop publishing "revolution" we've been reading so much about. The Sierra Group, a market research firm, has just surveyed 500 companies and found that only one in five plans to buy a desktop publishing system this year—and of those, most (72%) will purchase PC-based systems. Sierra Group spokeswoman Marty Gruhn reportedly said demand for desktop publishing systems will be brief and intense; "After that market penetration will quickly ensue and vendor shakeouts will follow."

Meanwhile, at the National Computer Graphics Association forum on desktop publishing, analysts predicted the next generation of desktop publishing software will be designed for specific applications, such as books, advertising, illustration, or technical documents. Current desktop publishing products will be caught in the squeeze from the high end, and a low-end of more sophisticated word processors.

So if desktop publishing's appeal is limited, where is the next revolution? If you ask a whole number of people, including Forethought's President Rob Campbell, it's in the field of "desktop presentations." He told *Softletter*'s Jeffrey Tarter there are 10-15 million "frequent presenters" who currently need transparencies for overhead projectors, or send out for batch-processed professional slides. If a micro can expedite these tasks and make them more professional, the market is wide open. CONTACT: Rob Campbell, Forethought, Sunnyvale, CA 408/737-7070.

$1 billion, and PC fax products will have 25% of that growing market by 1990. GMS president Gregory Friedman said the merger would be a link between scanners and desktop communications.

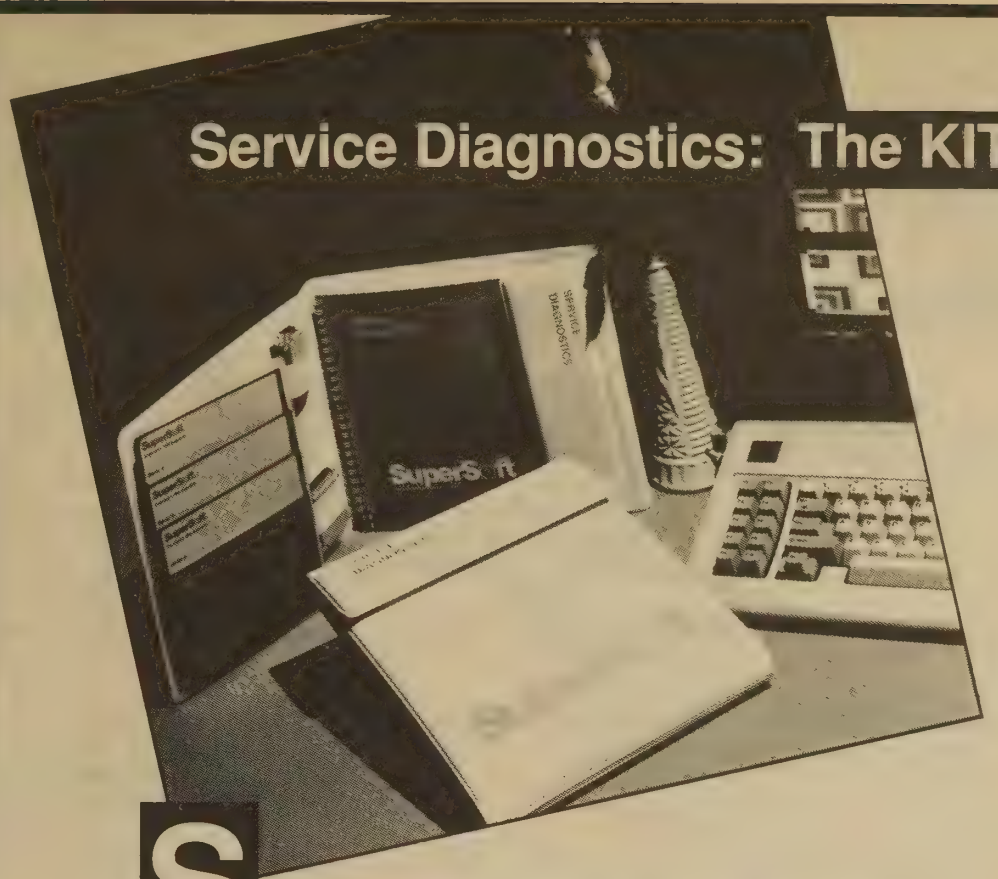
No price was disclosed, but DEST is publicly traded on NASDAQ and its shareholders will have to approve the transaction. CONTACT: Gregory Friedman, Gulfstream Micro, 305/994-6500; DEST, Patrick Jones 408/ 946-7100.

PECAN GOLDEN CHIPS

HARRIS CORP., Melbourne, FL, sold its Microwave chip division in Milpitas, CA to Litton Industries Inc. for an undisclosed amount of cash. The division was called a pioneer in the development of gallium-arsenide (GaAs) circuits.

HAYES MICROCOMPUTER PRODUCTS INC., Norcross, GA, donated its $500,000 Modula 2 Software Validation Suite to the Georgia Tech Research Corp. The suite consists of over 800 programs used to test Modula 2 written by Dr. Nicholas Wirth, who also wrote Pascal. Any money earned from using, selling, or licensing the suite will be used to support a scholarship in the name of Dr. Joseph Pettit, the former Tech president who died last year.

UNISYS, Detroit, announced it will call in its $200 million in 7 1/4% convertible subordinated debentures July 1, at 106.525% of face value plus interest. If you act by June 26, however, that $1,000 debenture can still be turned into 12.88 shares of Unisys common.



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Read Jan Lewis

Every month in the pages of MicroTimes, industry expert Jan Lewis of the Palo Alto Research Group offers topical analysis of industry issues and trends. Check "But Jan Lewis Says . . ." in this issue.

New Quadram Line

NORCROSS, GA (NB)—Quadram may need a score card to help people sort through its new product line, so Quad-deep in Quad-names is it. There are the QuadEGA+ and QuadEGA ProSync graphics boards for NEC's new MultiSync monitors—they include an add-in board called FutureCard to get better resolution, with drivers bundled for *Windows*, *GEM*, *AutoCAD* and *Lotus 1-2-3* (more on the way). There's the Quad386XT accelerator board with its Weitek WTL 1167 math co-processor to give your PC the number-crunching abilities of a super-mini. There are the Model 30 Quadboard and Quadboard PS/Q, both multifunction cards for the PS/2, as well as QuadMEG PS/Q and QuadPort PS/Q, which add either memory or ports to the new IBM line. And there's the QuadHPG Series 2, a monochrome adapter based on the Intel 82786 graphics co-processor, which won't ship until September because Intel can't keep up with demand. And there are new models of the Ricoh-engine QuadLaser printers.

Finally, they dropped prices on a lot of old products, like laser printers and EGA boards. CONTACT: Annette Gustafson, CAM Group, 404/925-7634.

Meanwhile, Elsewhere At Intelligent Systems

ATLANTA, GA (NB)—Did you know that Intelligent Systems MLP still competes against itself in monitors despite the sale of Intecolor Corp., which went to its first COMDEX as an independent with its color terminals and monitors last week? Yes, Princeton Graphics and Quadram, both Intelligent Systems companies, both make and sell monitors and compete against each other.

The rest of the company, meanwhile, is getting the act together. Datavue's Sotek-made Spark and Snap 1+1 were big hits at COMDEX, and Datavue used the attention to pitch its new 80386-based desktop model. And I ran into Bill Goodhew of Peachtree Software, another ISC company, who cheerfully claimed they're selling 4,000 copies of their new 8-In-1 accounting package each month.

Finally, what's the difference between a NASDAQ-traded publicly company and a private limited partnership on the American Stock Exchange? Not much except more profit, to judge from quarterly reports in ISC MLP sent last week. With net income of $1.775 million, 18 cents a share, and sales of $44.405 million, against net of $1.156 million, 10 cents, on sales of $30.310 million for the March quarter a year ago, these companies may yet be glad they stayed together.

TI Opens Software Migration Center In Austin

AUSTIN, TX (NB)—Texas Instruments has opened a center to help resellers move software to its TI System V operating environment. Conversion and performance assistance, consultation and evaluation to TI value-added resellers (VARs) will be offered free of charge. The migration work can even be performed before the VAR commits to selling TI equipment. CONTACT: TI Migration Center, 512/250-7070

PC Catalog-On-A-Disk For Dealers

NORCROSS, GA (NB)—It started as a little custom software job for a local computer distributor, but now Nick Christie's Catalog-On-A-Disk is threatening to become a neat product in its own right. "We originally made it a read-only program so a local distributor, The Super Source, could update its catalogs. They sent out the results, then their

customers called us asking for more flexibility, so we now have a program for dealers which lets them create an in-house master catalog. When a few said they wanted to send it to their customers, we then created read-only files for dealers so they could send out duplicates of the catalog to their customers. So we kind of went in a circle."

The complete version of the program, *PC Catalog II*, is now out for $199. That lets you update your catalog. Then, for another $49, you can get the read-only program so you can send your catalogs out, and customers can't change them. "We'll even customize the banner screens, too, so when the customer opens it up they get your name, not ours," says Christie. CONTACT: Nick Christie, Catalog-On-A-Disk, 404/446-5339.

Hayes—Breaking Up Is Hard To Do

NORCROSS, GA (NB)—She liked high-art and powerful people, he preferred working with powerful computers. So now Dennis and Melita Hayes are divorcing, and ownership of modem frontrunner Hayes Microcomputer Products Inc. is in court. Dennis wanted an amicable, no-fault divorce and filed papers with Fulton County in March. Melita's counter-claim lists the Hayes companies among the "marital assets" to be divided. The company calls this "purely a personal matter," but how can it be when one of the assets to be divided dominates its market and had estimated annual revenues of $135 million? Will the company stay private? Will it be sold, at least in part? Stay tuned. CONTACT: Jane Dryden, Hayes, 404/449-8791.

PECAN CHIPS

METIER MANAGEMENT, Houston, released Artemis Project, a former mainframe-based project management program. It requires an XT or AT with 512K RAM and a 10-30 megabyte hard drive, plus DOS 2.1 or higher. Metier is a subsidiary of the Lockheed Corp.

EXCALIBUR SOURCES, Atlanta, announced version 2.0 of its *Exsell* sales program, which automates prospecting. Now it's got built-in word processing and new telemarketing management features. It requires a PC compatible with 128K of RAM, a hard disk and modem, or a network with 640K of RAM per node. The single user version costs $395.

WELLS AMERICAN CORP., West Columbia, SC, announced it will begin deliveries of an Intel 80286-based AT compatible running at 14 MHz in 30-45 days. The company's current machines run at 12 MHz.

TANGENT TECHNOLOGIES, Norcross, GA, began shipping Tangentshare, which implements the Appletalk Filing Protocols (AFP) on IBM PCs. The product had been announced in January, and costs $350.

NEWSBYTES EAST

Analysts Pan IBM Meeting, Suspect PS/2 Not Selling Well

NEW YORK (NB)—Wall Street analysts were unhappy with what they heard and didn't hear at last week's meeting with executives from International Business Machines. As a result, IBM stock fell $1.50 a share to 158⅛ the next day. Big

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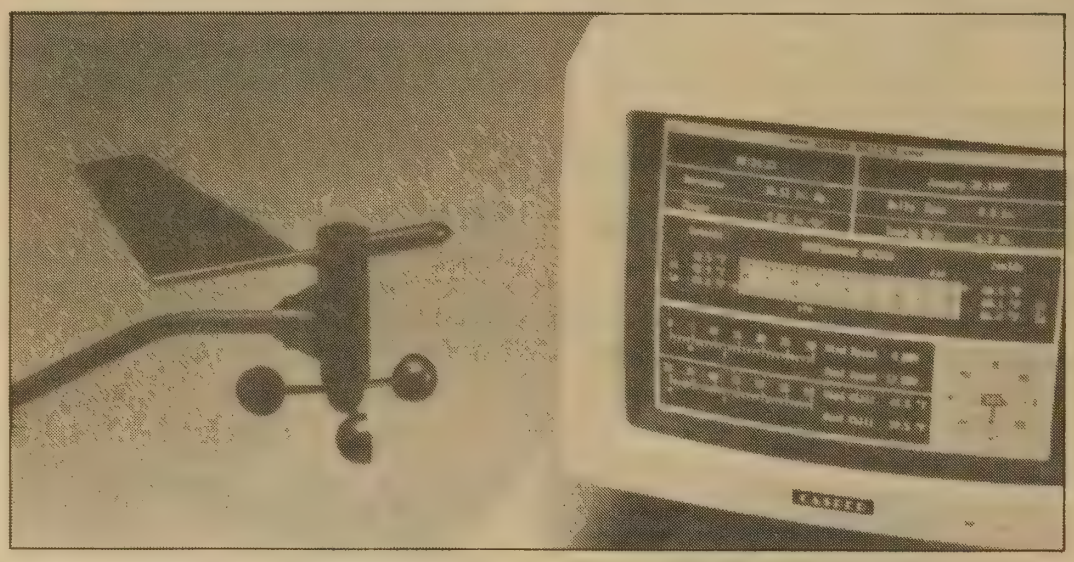

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Blue trotted out Edward Lucente, chief of U.S. marketing, to talk to the analysts, who apparently really wanted to hear about IBM's financial picture, not its marketing plans. The analysts also raised rumors that the new, highly-touted PS/2 line of personal computers isn't selling up to expectations. IBM denied the rumors.

In the meantime, IBM has approved 4G Data Systems Inc. of Staten Island to become a value-added dealer for the PC-Token Ring Network Integrator products. 4G said it has authorization to integrate and sell all of the hardware and software going into the IBM local area networks, and all of Big Blue's micro-to-mainframe products.

A third tidbit from IBM-land. The company says it will establish advanced computing centers in Rome and Tokyo for number-crunching applications. The two new centers will join two established last year in Kingston, N.Y. and Palo Alto.

Senate Leaders Urge Reagan to Hang Tough On Japan Sanctions

WASHINGTON (NB) — Four important Senate leaders last week urged President Reagan not to lift trade sanctions against Japan until "irrefutable evidence" establishes that Japan is living up to the semiconductor accord of last year. Senate Majority Leader Robert Byrd (D-W.Va.), Minority Leader Robert Dole (R-Kan.), Finance Committee Chairman Lloyd Bentsen (D-Texas) and John Danforth (R-Mo.), an influential Finance Committee member, wrote to Reagan at the Venice economic summit. The four warned Reagan that lifting sanctions "could damage future U.S.-Japanese trade relations and prospects for enactment of a sensible trade bill." According to reports in the Washington Post, the Reagan Cabinet has deep divisions on lifting sanctions. Secretary of State George Shultz and Treasury Secretary James Baker are in favor of lifting the sanctions. Commerce Secretary Malcolm Baldrige and U.S. Trade Representative Clayton Yeutter are opposed.

Toshiba Faces Pentagon Investigation Of Illegal Sales To Russia

WASHINGTON (NB)—The Associated Press reported last week that the Pentagon is holding up contract awards to Toshiba Corp. because the company may have been involved in illegal exports to the Soviet Union. Anonymous Pentagon officials told the wire service that there would be no move to suspend Toshiba as a defense contractor, pending the outcome of the investigation. In the meantime, the sources said, "there's a stall on." The Air Force, for example, has delayed selection of a contractor for $100 million worth of laptops, because Toshiba is a primary bidder for the job.

The AP says its sources indicate that Toshiba and Kongsberg Vapenfabrik, the Norwegian state-owned arms maker, are suspected of selling four large milling machines to the Soviets in 1985. If so, it's a violation of export control rules adopted by the U.S. and its allies, including Norway and Japan. The milling machines could help the Soviets make better, quieter, submarine screws.

US Computer Exhibit Opens In Moscow

WASHINGTON (NB)—An exhibit of American home and personal computers, including Apples, Amigas, and Ataris, opened in Moscow last week. The exhibit by the U.S. Information Agency is the first U.S. exhibit in the Soviet Union in the eight years since the Soviet invasion of Afghanistan. The computer exhibit will visit nine cities in the

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With a 20MB 1/2 HT 65ms Hard Drive $1699
With a 30MB Full HT 39ms Hard Drive $1899

CLUB 286 (12MHz Thruput) EGA System $1995

- Basic System Features Plus /• 80286-10 CPU
- High Resolution 16 Color EGA Card with Mono and RGB Output
- High Resolution EGA Monitor, 14" Nonglare IBM Quality
- Wait State Insertible Slots /• 2 Serials/1 Parallel Port
- 8/10 Keyboard Selectibility /• 12MHz Thruput

With a 30MB Full HT 39ms Hard Disk $2490
With a 40MB 1/2 HT 39ms Hard Disk $2540
With a 80MB Full HT 23ms Hard Disk $2870

CLUB XT TURBO

RUN

LOTUS 123 AUTOCAD
DBASE III XENIX
NOVELLE

Features:

- 8088-2 4.77/8MHz
- 640K on Board
- 8 Slots
- 135 Watt Power Supply
- Serial/Parallel Port
- Floppy Controller
- 360K Floppy Drive
- Keyboard AT Style

CLUB TURBO MONOCHROME SYSTEM WITH HIGH RESOLUTION GRAPHICS CARD AND HIGH RES MONITOR

$699

With 65ms 20MB Drive

$999

MONO MONITOR

'Run Hercules Graphics'

- High Resolution
- 12" Nonglare Screen
- 800 x 350 Resolution

$138

IBM Quality Monitors **$345**

EGA MONITOR

- 640 x 350 Resolution 16 Colors
- 640 x 200 Resolution 4 Colors
- FCC Class 'B' Approved
- EGA and RGB
- Auto Switch

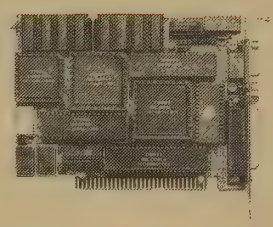
$480

NEC MULTISYNC

- EGA/PGA/CGA/MGA 800 x560 Maximum
- Plug and Play (All Cables Included)
- 14" Nonglare Screen
- Swivel Stand
- NEC 2 Year Warranty

CALL

DELUXE MICRO EGA



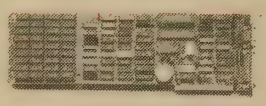
All New

Model 30 Compatible

- 800 x 350 132 Columns Mono
- Software Switchable
- Parallel Port
- TTL Port
- 640 x 300 CGA
- 720 x 348 EGA

CALL

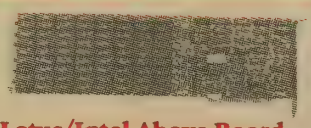
MULTI I/O EMS



- Fits Lotus/Intel/LIM/SIM Specs.
- Expanded Memory Board
- 1 Serial (2nd Optional)
- Installation Software
- Upto 2MB Capacity
- Clock (for XT)
- For AT/XT
- Parallel Port
- Game Port

$159

CLUB EMS FOR XT



Lotus/Intel Above Board Compatible

- 0-2MB Expansion Memory (OK)
- Installation Software
- Model 30 Compatible
- Fits LIM/SIM/EMS
- For PC/XT/AT
- Made in U.S.A.

ØK **$99**

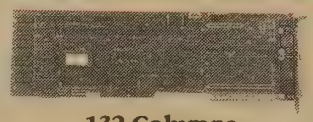
CLUB EMS FOR AT

16 Bit Bus

- Intel Above Compatible
- LIM/SIM/EMS Specifications
- For IBM AT and Compatible
- Installation Software
- OS/2 Applications
- Made in U.S.A.

CALL

HERCULES COMPATIBLE

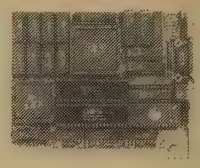


132 Columns

- Monochrome 132 x 44 Display
- Evergraphics from Everex
- Hercules Graphics
- Software Selectible
- Printer Port

ØK **$99**

MICRO EGA

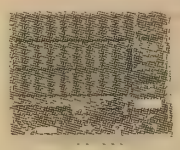


- Monochrome Hercules 800 x 350
- EGA 16 Color 640 x 350
- CGA 4 Color 640 x 200
- FCC Class 'B' Approved

$179

CLUB 576

(for PC/XT and Portables)

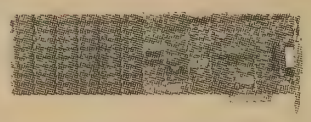


- Upto 576K can be Installed
- Supports 64K/256K DRAM
- Installation Software
- Short Card
- Made in U.S.A.

ØK **$55**

CLUB 384

CLUB 384 for PC/XT

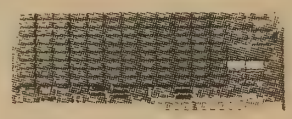


- 0-384K Memory Expansion
- Installation Software
- Serial Port
- Clock/Calendar
- Parallel Port
- Game Port

ØK **$88**

3MB CARD FOR AT

For XENIX, UNIX, OS/2



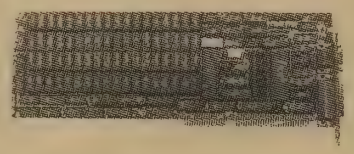
- Used as Ramdisk/Printspooler
- No Piggy Back Required
- Split Memory Addressing
- Installation Software
- 64/256K Back Fill
- 0-3MB Capacity

ØK **$155**

MULTIFUNCTION CARD FOR AT

Manager's Choice

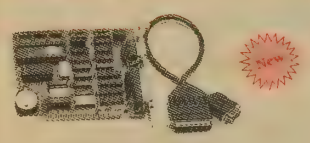
For Xenix/OS/2/Unix/Ramdisk, Printspooler



- Printspooler/Ramdisk Software
- Serial Port (2nd Optional)
- 128K Increment Range
- Back Fill Motherboard
- Installation Software
- Parallel Port
- Game Port

ØK **$179**

I/O & GAME PORT

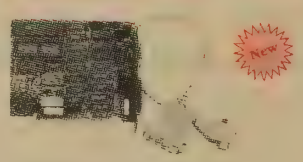


New

- Serial Port (Two Optional)
- Software for Installation
- Game Port (optional)
- Com 1, 2, 3, 4, Addressing
- Half Size Card
- Clock/Calendar

For XT $75

I/O & GAME PORT



New

- Serial Port (Two Optional)
- Com 1, 2, 3, 4 Addressing
- Game Port (optional)
- Software for Installation
- Half Size Card
- Clock/Calendar

For AT $75

OPTICAL MOUSE

Autocad/Windows/PC Paint

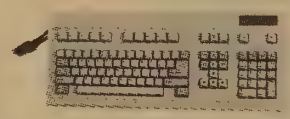
Free DR. HALO

- Mouse Systems Mouse
- 200 Dots/Inch
- Laser Driven
- 3 Buttons
- Serial Mouse

$119

ENHANCED KEYBOARD

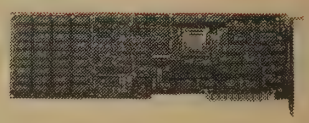
Model 5339
as in Model 30, 50, 60



- Separate Cursor and Numeric Pad
- 12 Function Keys
- 101 Keys
- IBM Click

CALL

ACCELERATOR



- Accelerate Your PC/XT to AT Speed
- Runs 80287 Math-Processor in 5MHz or 8MHz Speed
- Runs 7 times faster than PC or 33% faster than the IBM AT
- 80286 CPU
- w/128K RAM

$350

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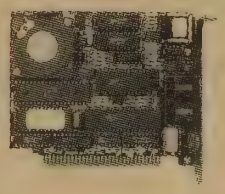
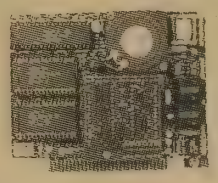
On the road or on the desktop the line of Everex Modems puts you way ahead of your competitors. Communication means power. Those who communicate quickly and efficiently get to the top fast!





- Bitcom Software (Smartcom, PC Talk Compatible)
- Auto Dial, Auto Answer, PC Dial
- Fully Hayes Compatible

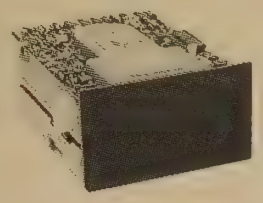
$108

- Glossy Manuals, Compuserve Information
- Half Card fits in any Portable PC/XT
- Comes with Modular Cables
- Error Checking

$199

FAST HARD DISK FOR YOUR AT

Our line of Software Hard Disks come packaged like no others! You get face plates, cables, glossy manuals, rails and easy to use software. All of this is packaged in a box which survive the worst in shipping! If you want it low level formatted call us

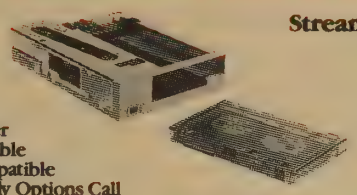


- 65ms Access Time
- Voice Coil Technology
- Auto Head Parking
- Plated Media
- Novelle Compatible
- Unix Compatible

30MB ST4038 (39ms)	$545
40MB ST457 (39ms)	$575
72MB MK56FB (25ms)	$920
80MB ST4096 (28ms)	$875
130MB PRIAM (18ms)	CALL

EVEREX TAPE BACKUP FOR XT AND AT SYSTEM

Stream don't Scream



- Easy Setup
- Glossy Manual
- User Friendly Software
- QIC 02, QIC 36 Controller
- 20, 60MB Cartridge Available
- Unix, Zenix, Novelle Compatible
- Archive, Wangtek, Kennedy Options Call

	INT	EXT
20MB		
60MB	CALL	
120MB		

20/30/40MB HARD DISK SUBSYSTEM

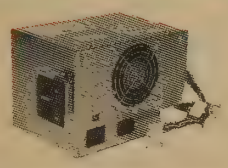
Superb Packaging! Superb Pricing

- 65ms Access Time
- Low Level Format Software
- Controller Card (WD Chipset)
- Made in U.S.A.
- Protective Packaging
- Bad Track Maps

	INT	EXT
20MB	$325	$567
30MB	$345	
40MB	$645	$780

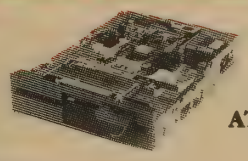
For 20MB and 40MB System a Floppy Controller is Available ADD $50

POWER SUPPLY FOR XT/AT



- FCC, UL, TUV Approval
- 5 Output Leads
- 135 Watt for XT — Price for XT **$85**
- 195 Watt for AT
- 5A, High Power — Price for AT **$140**

FLOPPY DISK DRIVE



For AT/XT/PC

- Black Bezel
- Teac or Fuji
- Voice Coil Head
- Grey Face Optional
- Mounting Brackets
- Mounting Rails Optional

360K (5 1/4")	$95
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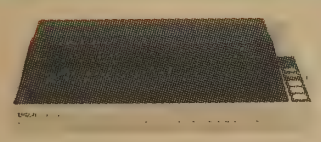
720K (3 1/2")	CALL
1.44MB (3 1/2")	CALL

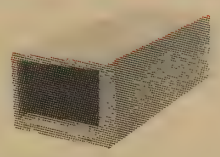
PRINTER EPSON FX 286e



- 9 Pin 240 CPS
- Easy to use Front Panels
- Letter Quality Print Out

CALL

CHASSIS

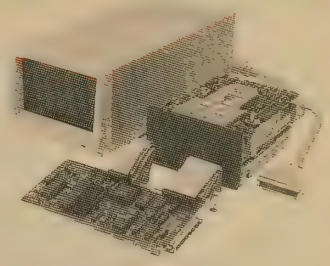


- Holds 2 1/2HT Drives
- Can Hold on Full HT Drive
- FCC Class 'B' Approved
- 40 Watt Power Supply with Fan
- Power Cord Available

$99

UPGRADE PC/XT WITH AT HARD DISK

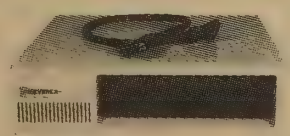
Now, put fast AT Hard Disks into your PC II or XT.
Fully Packaged with everything you need to plug and play



	INT	EXT
20MB 39ms ST4026		
30MB 39ms ST4038	CALL	
40MB 39ms ST451		

EXPANSION CHASSIS

Add 7 More Slots to Your PC or XT!



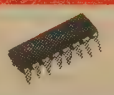
- 8 Slots (0 Wait State)
- 135 Watt Power Supply
- Shielded Cables
- Asynchronous Communication Card
- Diagnostic Software
- XT Size, Shape and Look

$428

WEEKLY SPECIALS

Toshiba 72MB	$920
Seagate 257	$535
1.2MB Floppy	$105
360K Floppy	$89

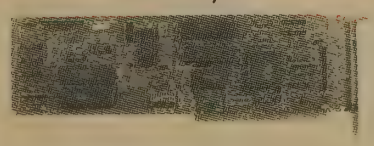
RAM CHIPS 64K/256K



64-150ns	256-150ns	CALL
64-120ns	256-120ns	CALL
64-100ns	256-100ns	CALL

HD/FLOPPY CONTROLLER

For XT/AT



- Software, Manuals Included
- Control 2 Floppy Drives
- Control 2 Hard Disks — For AT **$170**
- Western Digital Chipset
- MFM Incoding Logic — For XT **$140**

OTHERS

80287-6, 8, 10 Coprocessors	$199/$235/$299
PC/XT Controller	$45
Y Cables	$8
HD Controller for XT	$85
2WD Serial Ports for Mini I/O	$25
Bus Extender Card	$50
Eproms 2464, 27128	CALL
Switch Master	$88

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Soviet Union over the next 18 months. It is expected to attract as many as 750,000 visitors a day in each city. The show is called "Information U.S.A." It results from an agreement between President Reagan and Mikhail Gorbachev at the 1985 Geneva summit meeting. A Soviet exhibit on life in the U.S.S.R. opens in New Orleans in August. It will also visit nine cities.

Lotus And Telerate To Link Up New Financial Software

CAMBRIDGE, Mass. (NB)—Lotus Development Corp. and Telerate Inc. have agreed to develop and market software for fixed-income and foreign-exchange traders. Lotus will write software that will let users of Telerate data automatically dump the data into spreadsheets for analysis. Telerate, based in New York, supplies financial data. Dow Jones & Co. owns 45 percent of Telerate. The companies did not announce when the new software will be on the market or what its price will be. CONTACT: Lotus Development Corp., Cambridge, MA, 617/577-8500.

Data General Unveils Link To IBM Line

WESTBORO, Mass. (NB)—Data General Corp. has introduced hardware and software products that make it easier for users of DG's MV minis to talk to IBM PCs and clones. The products are called GD-pc*I. They allow users to build networks off the MV that recognize the PCs as terminals. CONTACT: Data General Corp., Westboro MA, 617/366-8911.

NEWSBYTES JAPAN

Microsoft Proposes Japanese PC Standard

TOKYO (NB)—With Microsoft's venture into MSX virtually dead, the company is trying again to develop a higher standard for Japanese personal computers and it appears they're getting the support of major Japanese companies. According to the *Japan Industrial Journal*, the new PC standard is IBM PC/AT compatible. It will be based on an 80286 CPU, the Phoenix BIOS, and ASCII's (Tokyo) graphic LSI. Machines based on this standard will support MS-DOS and MS-OS/2. A Japanese language feature will be developed by the Tokyo branch of Microsoft. Microsoft plans to announce the PC's specifications in order to license 15 Japanese computer makers by the end of the month. The company says the first product will roll off an assembly line by year's end. The new micros are expected to directly compete with NEC's dominant PC-9801 computer in Japan, if they're lucky. However, analysts say such a compatible micro standard may draw anger from Big Blue. Other analysts says those highly competitive PCs, which can easily be converted to an English language version, could be shipped en masse to the U.S. market in the near future. If that happens, it may rekindle the by-now ubiquitous Japan-U.S. trade problem.

SUSHI BYTES

FUJITSU'S 80386 MICRO—Fujitsu will start marketing an 80386-based powerful 32-bit personal computer at the end of the year. The prices vary with the models from US$8,143 to $12,071. The company has already been selling the 68020-based business computer, the FACOM G150, in Japan.

Japanese Logo Writer Debuts

TOKYO (NB)—Logo Japan, a Japanese subsidiary of Logo Computer in Canada, will release a Japanese version of *Logo Writer* early 1988. Logo Writer is an educational tool for teaching a turtle graphics-oriented computer language, Logo. *Japanese Logo Writer* uses a Kanji conversion front-end processor developed by Kanri-Kogaku-Kenkyusho, a company that helped develop Japanese *Lotus 1-2-3*. Logo Japan's spokesman says the prototype *Logo Writer* will be shown this July. CONTACT: Logo Japan, Aoyama-Honey Bldg., 2-24-12 Minami-Aoyama, Minato-ku, Tokyo 107 (Phone: 03-470-6511)

We Want Japanese Chips: Honeywell, DEC

TOKYO (NB)—Major American computer firms, such as Honeywell and Digital Equipment Corp., have been asking the Japanese Ministry of International Trade and Industry (MITI) to hasten the procedure for issuance of an export license for the chips. Exporting Japanese chips has been extremely difficult since MITI has been watching those exports; its strict surveillance is based on the Japan-U.S. agreement regarding the monitoring of chip prices.

MITI wants to help out those American chipmakers, but it cannot do it alone. In the wake of the trade friction and higher prices of the yen, Atari recently decided to use American chips. However, many American computer companies are still buying computer parts from Japanese firms, despite the situation. Reportedly, Cray's supercomputer has been depending 100 percent on Japanese memory chips. Apple has been using them a lot. Moreover, Digital Equipment Corp. will assemble the VAX series in Japan this July, using lots of Japanese parts.

Ex-Sord President Assembles Low-Cost AT-Compatible In Hong Kong

TOKYO (NB)—Former President Shiina of Sord in Toshiba Group has set up an assembly plant for personal computers in Hong Kong. The new firm, Proside, will build a low-cost IBM PC/AT-compatible computer, getting parts from Japanese and Hong Kong makers. Their PC, the Proside 286, will be equipped with PIPS, which is a best seller programming language of Sord. The Proside 286 will be sold in Japan and the Southeast Asia towards the end of this month. The PC does not support a Japanese language feature.

Lotus Japan Prefers Short Name

TOKYO (NB)—Lotus Development Japan will officially change its corporate name to "Lotus" on June 15. The major reason is that current name is too long to handle efficiently in their routine work. Meanwhile, the company plans to set up more authorized training centers for *Lotus 1-2-3* in Japan. The current 20 centers will be increased to 50 soon. Lotus Japan aims to gain a 15 percent share in the Lotus group's total sales in the world. CONTACT: Lotus, 3-10-11 Toranomon, Minato-ku, Tokyo 105.

Fujitsu And IBM Bury The Hatchet

TOKYO (NB)—Two computer giants, Fujitsu and IBM, have almost settled their three-year long software copyright infringement battle. The issue started when IBM filed a suit against Fujitsu, charging Fujitsu had allegedly infringed upon a 1983 confidential agreement with IBM. In a recent report to the shareholders, Fujitsu mentioned, "Fujitsu has partly settled the copyright issue with IBM, and the two firms have also found solutions to the rest of the points in this issue." According to industry sources, Fujitsu will pay extra royalties to IBM, but the amount will not be so large as to affect Fujitsu's business. This news allowed Fujitsu's stock to recover from a recent plunge. CONTACT: Fujitsu, 1-6-1 Marunouch, Chiyoda-ku, Tokyo 100.

Hitachi Closely Allies With Unisys

TOKYO (NB)—Hitachi and Unisys (USA) have decided to closely cooperate with each other on large-scale computers. Unisys has asked Hitachi to make a central processing unit for its large-scale general purpose computer, the Unisys 1100 Super-90. Their recent agreement is more significant than the current agreement which covers Hitachi's production of CPUs for Unisys. The new agreement says Hitachi will not only produce the chip, but also design it. Considering the rapid appreciation of the Japanese currency, it is not at all advantageous for overseas firms to design and produce chips in Japan. But it seems Unisys has found more values in Japanese high technology, says an analyst. All in all, cooperation is better than split. CONTACT: Hitachi, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100.

Japan Unisys To Open In October

TOKYO (NB)—According to industry sources, Vice President Koichiro Nishikawa of Mitsui Trading will possibly assume the president's post of Japan Unisys, which is scheduled to start business on October 1. Currently, Univac Japan and the Toyko branch of Burroughs (USA) are discussing details of the merger, following the merger of their parent firms in the U.S. Univac Japan is owned 34.2 percent by Unisys (USA) and Mitsui Trading respectively. Mitsubishi Electronics and Oki Electronics are also shareholders. Business in this Japanese subsidiary is going well—Univac Japan's sales in fiscal 1986 increased by 10.1 percent over the previous year. Meanwhile, the Tokyo branch of Burroughs recorded a US$143-million decrease in its sales last year. The future of 8,000 employees for Japan Unisys seems to be quite promising, due to a possible investment from Hitachi and Toshiba.

Atari Turns To American Chip Makers

TOKYO (NB)—Facing skyrocketing price of Japanese chips, the California-based home computer maker Atari will soon cease getting its supply of 256K bit dynamic RAM from Japanese makers. Instead, the company's memory chip will be supplied by American firms. Currently, Atari has been buying 256K DRAMs from major Japanese electronics makers, such as NEC, Toshiba, Fujitsu, and Hitachi. With those chips, the company has been assembling game computers in Taiwan. Due to the higher price of chips in the wake of MITI's chip production restriction order, Atari had to turn to American firms, such as Micron Technology and Texas Instruments. According to a published report, Atari was formerly getting 70 percent of its total parts supply from those Japanese firms. But now the rate has dropped down to 45 percent.

continued on page 136

The hit of 1987

Z-386

A NEW GENERATION OF TECHNOLOGY THAT OFFERS ULTIMATE SPEED & MAINTAINS TOTAL COMPATIBILITY WITH THE PREVIOUS GENERATION.

SYSTEM MEMORY

All of the system memory is on a true 32-bit board, the same as the COMPAQ 386. Using 100 ns Static RAM, the system is expandable to 10 MB without occupying an extra slot.

- No refresh time to waste as DRAM
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BIOS RELOCATION

The system comes with 1MB of RAM: 640K for DOS, and 384K for system use. The Phoenix BIOS & EGA BIOS can be relocated into the 384K, 100ns Static RAM.

- OP SYS execution becomes ultra fast.
- EGA acts as fast as the 32-bit card.

SPEED SELECT

The system speed can be switched to all possible frequencies to prevent conflict (16, 8, 6 & 4.77 MHz). At 16 MHz (SI=18.4) it is equivalent to a 20 MHz AT 286, 3 times faster than an 8 MHz IBM AT.

80287 CO-PROCESSOR

The 80287 math chip can be operated from 16 MHz down to 4 MHz. In other words, any 80287 chip can be used in the machine, unlike AT 286s where the speed must match.

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INTEL 80386-16 16 MHz CPU

- 1.2MB TEAC Drv. reads, writes & formats 360K & 1.2 MB
- 200 Watt UL listed Power Supply.
- 8 Expansion slots. (1) 32-bit, (5) 16-bit, (2) 8-bit.
- 16-bit Western Digital H-Disk and floppy drive ctrl.
- 1 MB of 100ns Static RAM (expandable to 10 MB).
- Maxi Switch keyboard with tactile feel. Reset switch.
- Either Phoenix or Award BIOS is available.

Tips from Z-Tech

The nicest feature of the 386 computer, other than its 16 MHz CPU speed, is the speed-up cache memory above 640K. Here is where many 386 clones miss the boat. Most 386 clones have 512K on board, but to expand the memory a 32-bit memory board is needed, which doesn't exist yet. So you end up with a 16-bit memory expansion card using DRAM, which slows down the machine.

Today's Best Buy

40MB ST-251 40m	$499	LQ 2500	899
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NEC Multi-sync	539	EGA Video 7 Delux	249
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- Custom Eprom and 80287 sockets.
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As reported in Computer Currents Volume 4 #17 "People have been impressed by the Z Technology-AT Plus, and it was their choice among the many local compatibles." . . .

"All the Hardware is replaceable with IBM parts and offers a money back guarantee for any incompatibility" . . .

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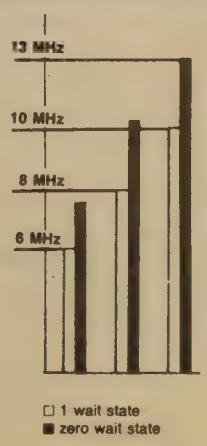

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Sun Workstations Meet

An Interview With Sun Microsystems Co/Founder Bill Joy

Although Sun workstations tend to be discussed in hushed and reverential tones by certain factions of the cognoscenti, the average PC user may well never have heard of them.

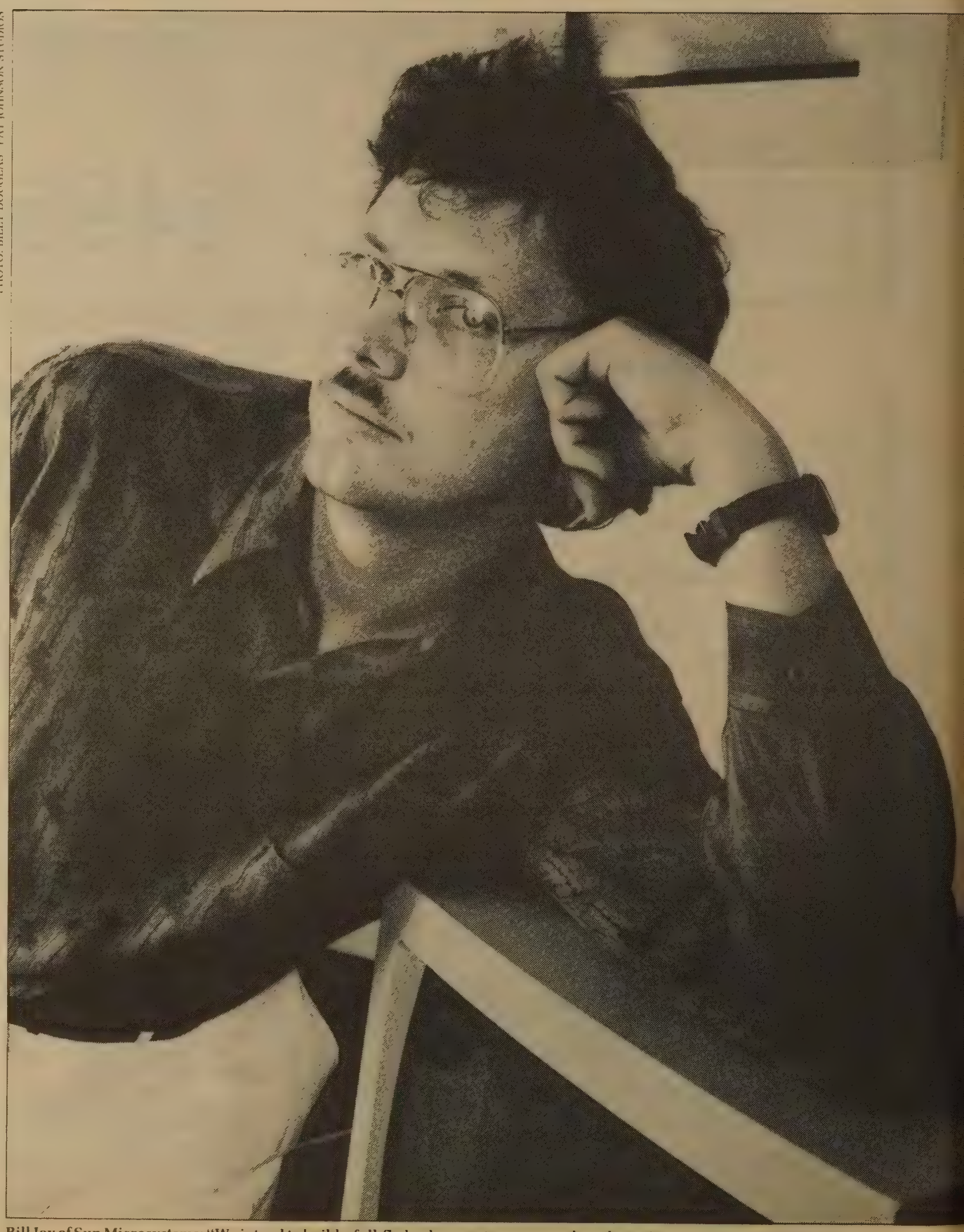
"We don't advertise," grins Eric Schmidt, Sun's vice president and general manager of its software products division, with the cheerful, matter-of-fact assurance of one whose company's chief problem is producing enough workstations to satisfy the hordes lined up to buy them. Not that Sun's resting on its laurels—it spends a whopping 12-13% of its earnings on research and development, compared with the 2-3% that's more typical of the industry.

Based in Mountain View, Sun was founded in 1982 with $4 million in venture capital. In the first nine months of its fiscal 1987, Sun reported a net income of $25.5 million on revenues of $348.6 million.

From its inception, Sun has been at some pains to distinguish itself and its line of 32-bit microprocessor-based systems from the world of microcomputers. Its workstations are most commonly used in networks, though they can be configured for standalone operation. They are typically much faster than personal computers, offer superior graphics capability and provide greater storage capacity. Sun offers a wide range of hardware and software options as well as full product support; its marketing, to clients ranging from corporations to universities and government, is done mainly by its own sales force rather than through a retail/VAR sales channel; OEM contracts with such clients as Toshiba, Eastman Kodak, and Wang Laboratories account for 40% of its sales.

However, as PC-based workstations become more common and the advent of such 32-bit micros as the Macintosh II and the various 80386 machines blurs the distinction between micro and mini, Sun is taking aim at the market share formerly held by purveyors of personal computers in the workstation environment. And, as a result of a series of strategic choices made over the last

PHOTO: BILLY DOUGLAS PAT JOHNSON STUDIOS



Bill Joy of Sun Microsystems: "We intend to build a full-fledged computer company based on microprocessor technology."

The PC Environment

They're based on the 68020's 32-bit architecture.

They run a powerful version of UNIX and offer a vast number of hardware and software applications.

They pioneered connectivity and graphical, window-type interfaces.

They are, in short, the act that microcomputer-based workstations like the Macintosh II and PS/2 have to follow.

By Mary Eisenhart and Bennett Falk

few years, it's positioned to offer a formidable challenge to the PC vendor.

First of all, long before connectivity became a buzzword, and at a time when proprietary technology was the norm in the IBM- and DEC-dominated technical workstation marketplace, Sun made the decision to base its products on the hardware-independent UNIX operating system. (Co-founder and vp of research and development Bill Joy implemented and designed the 4.1BSD version of UNIX at UC Berkeley and was responsible for the memory and networking enhancements to 4.2BSD. He's also the author of the acclaimed screen editor *vi*.)

Further, Sun chose to work cooperatively with third-party developers of hardware and software in developing industry standards. Its third-party program, Catalyst, offers software and hardware solutions for computer aided software engineering, electronic and mechanical design automation, electronic publishing, artificial intelligence, manufacturing, and other applications. One result is that Sun workstations have been quite happily talking to computers from super to micro for some time, even as the PC world is starting to discover connectivity; the company's recent acquisition of Centram Systems West (*MicroTimes*, March 1987) and its *TOPS* package, which lets users of UNIX, DOS and Macintosh computers transparently access each other's files without a central file server, is part of its strategy to incorporate Suns into the microcomputer-based workplace.

Most recently, on April 6 Sun announced a dramatic price reduction on its bestselling entry-level workstation, the Sun-3/50M, from $7900 to $4995. For that $4995, a price which compares favorably with PC-based alternatives (to say nothing of rivals in the minicomputer world), you get a built-in Ethernet connection, 1.5 MIPS performance, four megabytes of memory, and a 19″, 1152 x 900 pixel monochrome monitor. You also get the Sun version of UNIX, which merges System V with the 4.2 Berkeley enhancements and

offers the industry standard Network File System, the SunPro programming environment, and a full complement of software development languages. Should you decide to run the machine as a standalone unit, you can choose from a 3/50M configuration with a 71-megabyte mass storage system and 60-megabyte tape backup for $9995 and a version with 141 megabytes of storage and a 60-meg tape backup for $11,495. At the same time, Sun announced price cuts of up to 50% for its support services and drastic reductions in the cost of memory enhancements.

"We're not merely dropping prices," said president and CEO Scott McNealy at the time of the announcements. "We've anticipated the emergence of the technical PC market and have built the necessary production capacity to capture market share early. Our PC-NFS products give users a transparent migration path from their old DOS environment to UNIX. We already have over 850 technical applications and the system performance and functionality that other vendors are still trying to attain. We believe it will take them a long time to catch up."

He added, "In the meantime, we'll not be sitting still. This is only the beginning. When 1987 closes, Sun will have redefined the workstation market with an exciting series of products and aggressive marketing programs."

We recently had the opportunity to converse with Bill Joy about Sun's history and the philosophy that's shaped it. Surrounded by an impressive assortment of color and monochrome workstations in desktop and tower configurations, he evinced the unique blend of hacker zeal, technical wizardry and obsession with excellence, along with a hefty dose of common sense and business savvy, that seems to distinguish the company.

Bill Joy: "I think PCs are virtually cheap but really expensive, because it's almost like you had to buy a car and the tires were optional. In a Mac the KEYBOARD is optional—c'mon, give me a break. I mean, they have two keyboards, you're going to have to buy at least one."

How did Sun get started?
Sun grew out of a project at Stanford. It was originally an acronym standing for Stanford University Network. It was a project that Andy [Andreas Bechtolsheim, co-founder and vice president of technology], the guy I was just talking to in the hall, had done hardware for in 1980, 1981. His goal was to create a graphics terminal.

Andy's notion of a terminal at the time was something that was more powerful than most minicomputers, with virtual memory and 32-bit architecture and a large bit-mapped screen. I was involved at Berkeley with another project that was doing 32-bit UNIX software. We got together—Andy had gotten together with two people who'd been involved with startups here in the Valley, Scott McNealy, who'd been involved with Onyx, one of the early UNIX minicomputer sort of companies, and Vinod Khosla, who'd been an early person at Daisy, a CAE company. They got together in January of '82 to start Sun, which was incorporated in February of '82.

What we've really been doing is building computers out of microprocessors. The most notable thing for microprocessors has been microcomputers—PCs, Apple IIs and IIIs, 6502, Macs. We take the same microprocessor technology and build computers, as opposed to microcomputers. Microsystems means microcomputer technology, but they're not microcomputers. So today our product line, microprocessor-based systems, is as powerful, essentially, as anything DEC has. We intend to build a full-fledged computer company based on microprocessor technology. I think most people will be familiar with us for our workstations, but over time they'll see us building larger systems as well.

How extensively are you involved with building larger systems now?
They're larger in the sense of performance—that's [indicating a middle-sized tower] about the largest they get physically. In fact the same processor board that goes into these smaller systems can go in the larger one; the only difference is that you put more disks with it. We have a full performance range from our cheapest machine, a node that goes diskless on a network for like $5000, up to something that may be configured like that [tower], with a gigabyte of fast disk and so forth. That would sell for 50- or 60- or 70,000 dollars.

You recently lowered the price substantially on your low-end workstations. What was the thinking behind that?
Well, it was getting to be inexpensive to manufacture, and I guess we looked at our margins and decided that what we had was the technical workstation, which had very similar features to what people thought of as a technical PC. It was cheaper, in fact, because PCs, when you configure them to be full systems, turn out to be very expensive when you get around to adding the display and enough memory, and the software, and especially the disks that we don't need because we run in a network environment.

There was such a business opportunity, and our strategy has always been to base our prices on the cost, so we just brought things in line with the costs. We've always been aggressive on price, because there's so much elasticity. We're just delivering more value to our customers by our pricing, especially at the low end. None of the other workstation vendors has matched that—we're substantially cheaper than anyone else now. In fact I think people are selling graphics terminals that cost as much. So it's clear that we're just ahead in that space, and we've got essentially a whole factory that does nothing but build that particular model.

It's a very mature product.

How long has it been out?
January of '86. [laughs] That's *very* mature. Eighteen months is a long time. But it's a very simple product, it's very easy to build, it's very reliable, and it solves a lot of things you need to do. It can run all the software that doesn't require color, basically, that most people want to run.

And all your equipment is built with a high-speed network connection.
It's standard on all the machines. It's on the CPU board, as is the display.

Which changes most points of price comparison, because most vendors consider those options.
Most people have it as an option. But it turns out it's such a small number of chips, it's a nuisance to have it be an option.

In a sense, you can make yourself appear cheaper if you leave out enough stuff and define the system you're comparing as being stripped enough. I think in that sense PCs are virtually cheap but really expensive, because it's almost like you had to buy a car and the tires were optional. In a Mac [SE and II] the keyboard is optional—c'mon, give me a break. I mean, they have two keyboards, you're going to have to buy at least one. They could make the other one an incremental charge. But instead they make them both optional and it makes the price appear lower.

So what you're getting for your $4995 is a full system?
Everything.

And you don't have to add anything?
Either you're going to put it on an Ethernet, in which case you have to pick one of the two kinds of Ethernet cables to hook it to—there's thin Ethernet and there's thick Ethernet. And if you're going to run it without a network you'll have to pick a disk.

In general we don't include the Ethernet cabling hardware because, essentially, a lot of people like to buy it from 3Com or someone directly. Because we don't really add any value buying cables and reselling them. But that includes all the software licenses that people need.

That's the UNIX software bundled with the system?
Right, and the window system, and the little basic programming languages and tools.

It turns out that the box of documentation is actually a separate item, because when people order six to twelve of these, they really don't want twelve copies of the documentation. So you buy *n* workstations and *m* copies of the documentation, which typically is a much smaller number.

What advantages do Sun systems offer over PC or Macintosh systems?
Well, DOS and the Mac are really constrained by the fact that they have to go through retail. They have to be done it a way that fits. And the

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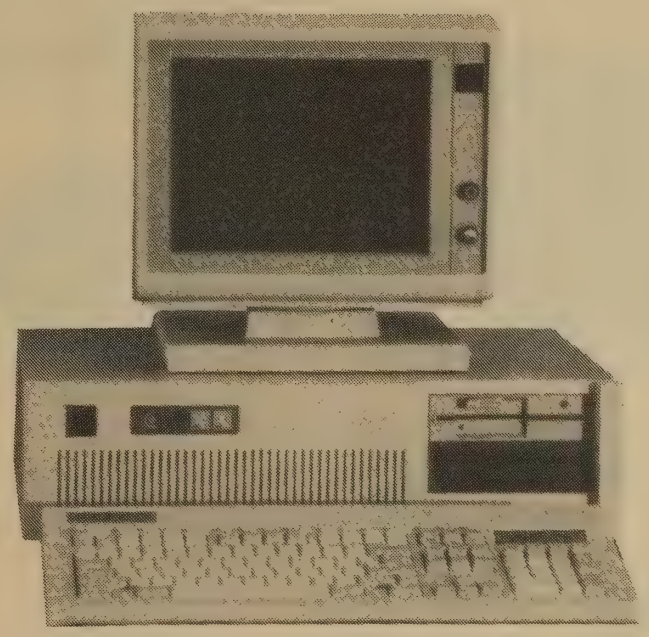

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problem with UNIX, the systems we sell, is that our energy hasn't been put on making things good for retail, but on solving particular problems.

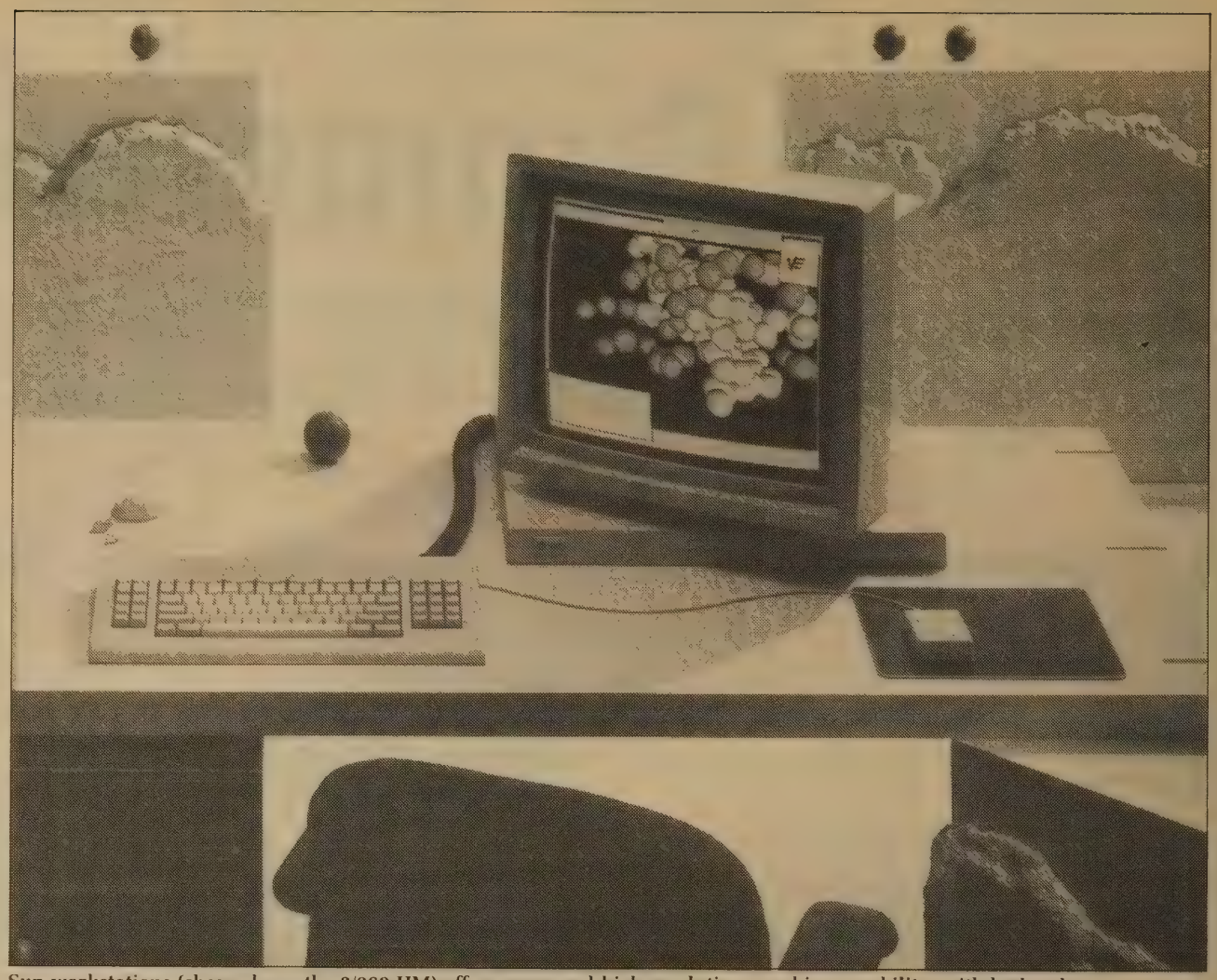
In a sense, our system's too complicated, because it's working so hard to solve problems; retail in a sense is too simple to solve the problems of engineering. What a Mac is, essentially, is a replacement for a typewriter. A Sun typically is not a replacement for a typewriter—the people who had them didn't have typewriters. They had pencils, and paper, and drafting tables and who knows what—telephones, tv screens, all sorts of different things that weren't typewriters.

Why would somebody with PCs or Macs already in place want to look at your products?
Is there different software, and the software solves different problems? A computer is a problem unless it solves a problem. These are computers and those are toys, in some sense. I mean, they're typewriters. PCs—if they don't run *Lotus*, they don't run *Excel*, or they don't run *Word*, what do they do? The game of baseball? I mean, what do people really do with them? There aren't really that many applications.

You place a lot of emphasis on the distinction between microcomputers and microprocessor-based computers. Could you clarify that?
The personal computer industry is, of course, very concerned with cost, and this concern with cost in the past has created a lot of problems in terms of limitations that the software has had to deal with, in particular 16-bit address spaces, segment address spaces, low quality displays and so forth.

The workstation industry has been using microprocessors to replace larger machines, basically as a cost *reduction*, but with performance and functionality more an issue rather than simply cost. I think we're going to continue to see microprocessors used to build very powerful machines, where we use micros because it's the easiest way to get that performance level, and the microcomputing industry is using microprocessors simply to provide a minimal level of performance to people who just want to have a box. So we see a new generation of machines coming based on RISC technology and other pipelined processors that will be very high performance and will largely replace existing powerful workstations and minicomputer-style machines—and those are really computers based on microprocessors, because that's the easiest way to do it, as opposed to microcomputers, like the Personal System or the Mac, where the microprocessor's performance isn't the real issue.

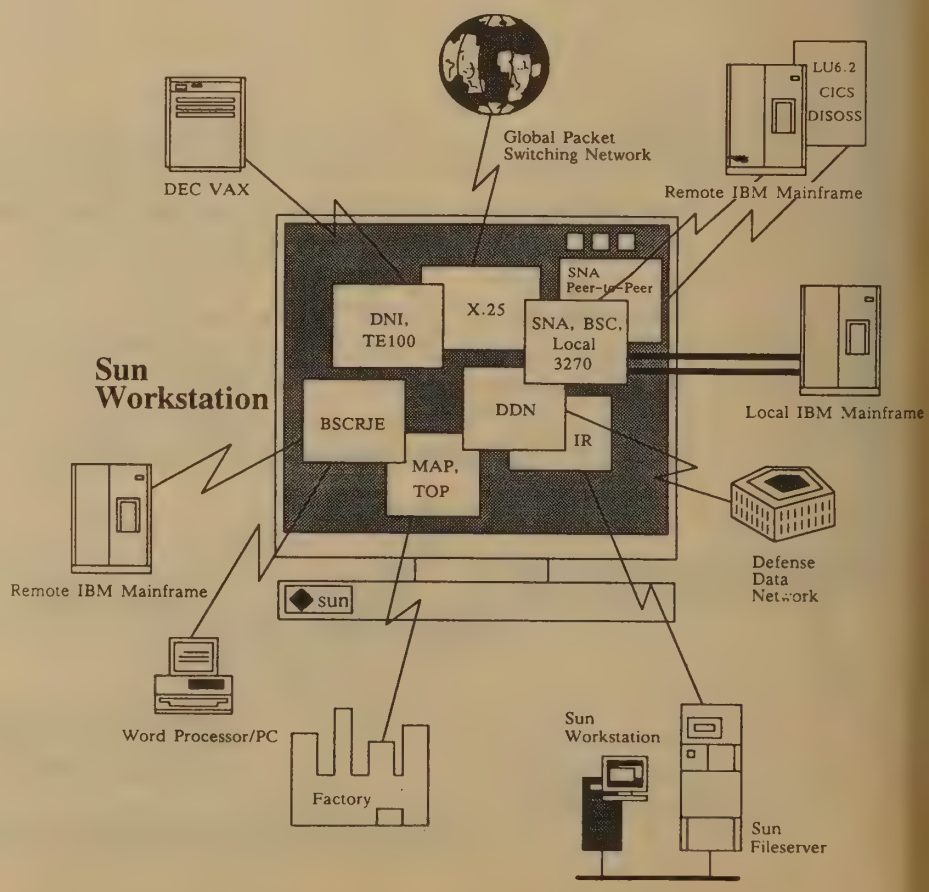
See, Apple, two or three years after the 68020's been available, is really not introducing it into their product line in any major way. The Mac SE introduced this year is still based on the 68000, even though the 68020's been out for over two years and would give them two to three times the performance at roughly the same price. Those are microcomputers; that's the attitude of the microcomputer industry. And that ultimately drives the applications, and it takes years for applications that use power to come around because people don't supply it. The installed base really drags them very slowly—they're scraping along on installed base.



Sun workstations (shown here, the 3/260 HM) offer power and high-resolution graphics capability, with both color, monochrome and gray-scale monitors.

That being so, why would a PC or Mac-based office want to get Suns?
Well, it runs different software. It runs good CAD software, it's a much better environment for programming, there are better document preparation tools in all the areas. I think also they'd find that the Suns would network to the Macs very well, and in fact are much more capable of networking to other computers than the Macs or PCs are, in terms of connectivity to IBM or DEC or any of the other larger machines. The Sun can also act as a bridge between the PCs and the corporate data processing environment, essentially.

The 3/50's been out since January of '86. It must have had some predecessors.
Right, there was. It was called a 2/50—that was about one third the



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- Real Time Clock & Calendar
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- Phoenix BIOS
- Wordstar Professional Release 4*
- Spelling Dictionary*
- Thesaurus (Synonym Finder)*
- PolyWindow & Desk Organizer*
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performance and one half the memory, and it didn't have a disk controller built in, and cost $1000 more. So basically we gave you a disk controller, twice the memory, three times the performance, and reduced the price.

So it was kind of a surprising announcement, but that's been fairly typical, since we base prices on what things cost, and the technology's advancing—things that are better aren't necessarily more expensive. I think that trend will continue—performance is more a function of the design, in a lot of cases, than of the cost. And a good design is something you only pay for once.

With the 19″ screens and the mouse-driven user interface, the Sun gets identified in the public's mind as a particular kind of user interface. Has that always been around, or was there a time when Sun made computers that were basically character terminal driven?

No, we avoided that, because basically the business model, if you sell somebody one of these boxes with a bunch of terminals, the revenue capture is around $50,000. And we goal our sales force at over $3 million per salesperson, and they would never be able to make their quotas. There's a lot of people trying to serve that need, and we're not really set up to be a timesharing vendor.

People tend to use PCs as terminals, so if you have a mixture of PCs and workstations and some servers, we support that quite well.

Where was Sun with its product development at the time the Macintosh came out? I've always sort of thought of the Macintosh as a kind of miniature Sun.

Oh, the Mac was basically just the Lisa technology repackaged. They didn't really create very much technology. The Mac originally was like an 8080-something. In some sense the Mac II is just a Lisa, and the Mac SE is a repackaged Lisa.

Sun really had a Sun prototype—the Sun 0, if you want to call it that—at Stanford in '81. The UNIX environment that we run was largely complete in '79, '78.

I remember reviewing Lisa specs in '80 or '81. But that machine failed, I think, because of internal Apple politics which caused it to be priced high. It wasn't allowed to be competing with the Macintosh, so they priced it unreasonably high, which prevented it from ever getting anywhere—people laughed at a $10,000 machine, they didn't want to pay 10K for a PC.

Apple didn't have a distribution channel. So Sun was a Lisa, plus the philosophy of industry standards going through a direct channel. It continues to distinguish Sun from Apple—Apple's a consumer electronics retail company, Sun's a computer company, and I don't see those two things being the same any time soon, because computer companies solve different kinds of problems than, say, stereo stores.

Joy on Sun's open systems policy: "A typical problem that people have when they work with other people is that they're afraid that people will steal part of their revenue. It's sort of like being a little kid and wanting to eat everything and not sharing. But that's how you make friends, and friends are useful, in that business is really done on the basis of personal and business relationships that work well."

Going back to the early days, what was behind the decision to make this a UNIX-based system?

Well, they needed software, and they hired me, so that made it inevitable.

But they really didn't have a choice—they needed a 32-bit system. See, UNIX has no competition, really. There's nothing else that's been available as a portable 32-bit system. It's the easiest way to win a competition—to have no competition, and there was nothing else, except for proprietary systems, which is what Apollo did, and what DEC and IBM had at the time.

We didn't believe we were solving any problems by—I could've set out to write a new operating system or something, but I was too lazy. We had other problems to solve. And there was a talent pool—we had people who knew how to do UNIX, so that made it worthwhile.

Historically it seems you've had an unusually open policy about working with third-party developers.

That's right, and it disturbed the analysts too.

Why did you decide to do that?

Because there was more leverage. Because, being small, you can't solve every problem. You need to use other people.

A typical problem that people have when they work with other people is that they're afraid that people will steal part of their revenue. It's sort of like being a little kid and wanting to eat *everything* and not sharing. But that's how you make friends, and friends are useful, in that business is really done on the basis of personal and business relationships that work well, as opposed to being sort of isolationist.

It's sort of a breath of fresh air. I mean, it just seemed like the right thing to do. It's sort of a cultural thing—we weren't interested in starting over. I guess most people, they start a company and do everything themselves from scratch. It just works less and less in a world that gets increasingly interdependent and complicated. We *can't* go off and invent our own protocols—we've got machines out there that we need to talk to have them. We've got to have FORTRAN, we can't go out and invent our own programming language, it's just not practical.

So the question then is, once you have that philosophy, what you want to do is develop a culture and a business strategy which work well in that environment. And that's a very different kind of the business strategy and culture you have than if you are going your own. So the people that are doing it the other way have a philosophical transition, a mindset transition to make, and it's very difficult. They need to go through corporate psychotherapy, and it's not clear that it works.

How has the belief in open systems worked out?

Well, we're the fastest growing company in the history of the business. It's a question of when do you hit the wall—is there continuing opportunity at the size we are now? We're the size where if we wanted to do more, we couldn't do it, without this strategy.

I guess that our belief is that in direct sales of computers, there's only going to be three standards. There's going to be IBM, DEC, and a UNIX-based standard, and we still have the chance to be the dominant company in that third standard. And the only way that environment is going to work is if a lot of people collectively sell the standard, because no company's large enough to define the whole standard.

So we want to be a major player. First of all, we want the UNIX open systems market to exist, and then we want to be a major player in it. So part of our philosophy was to help create that market, and part of it is to hope to find some understanding of how to become important in the market. I mean, if the world is defined by open systems and we understand open systems, we can probably find a way to gain whatever the open systems analogue of proprietary advantages are. There certainly are things you can do, even in an open environment, to cause people to be repeat customers—cultivating relationships, using technology in a more leveraged way, sales and service. Those are the sorts of things we have to focus on.

We just have to have the best technology, or fundamentally the equation doesn't work, because DEC and IBM are so large, and they have so many more people. Those are the real competitors, it's not Apollo, they never were the competitors, it was always DEC. I think that's why these people have trouble competing with us, because they were competing with us as if we were competing with them, and we really weren't. We always had a strategy of competing with DEC, so the other companies were always surprised at what we did, because it didn't make the most sense if they were the competitor. The financial analysts are beginning to understand this now. We're trying to be a computer company, not a microcomputer company. (Sun Microsystems, 2550 Garcia Avenue, Mountain View, CA 94043, 415/960-1300.) □

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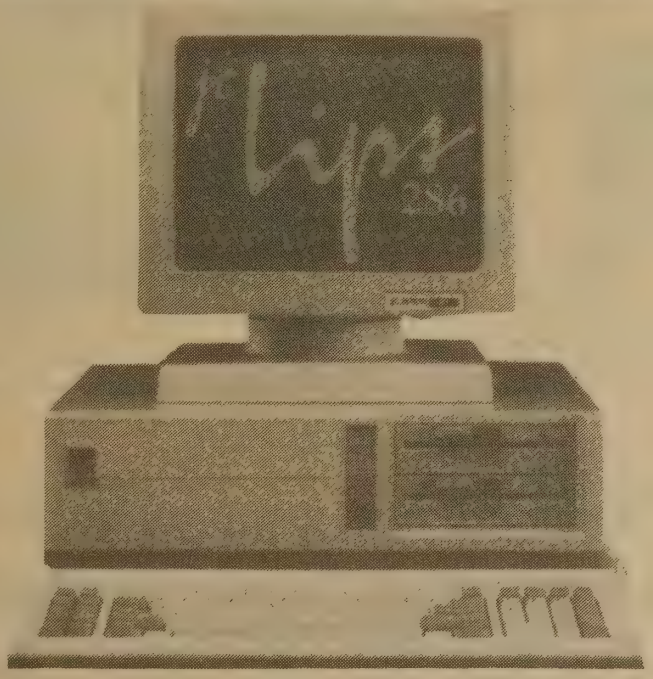

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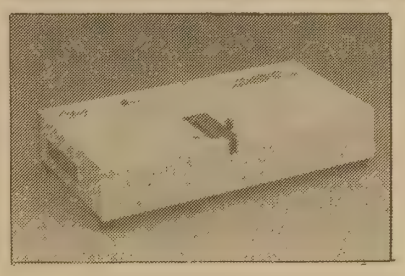

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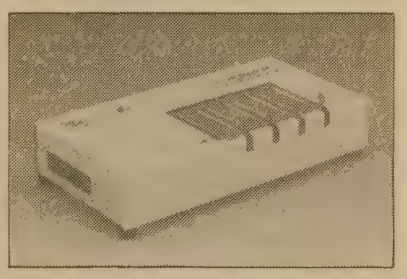

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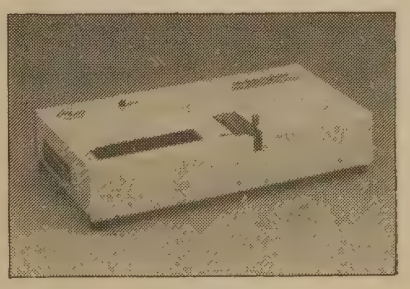

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Infinity Software's Grand Slam

From tennis to desktop publishing, Tom Maremaa's Amiga-friendly startup explores limitless possibilities.

By Sharon Rufener

PHOTO: MARY EISENHART

Tom Maremaa of Infinity Software — tapping the unrealized potential of the Amiga with a variety of innovative products.

TOM MAREMAA:

"Software has gone as far as it can with 6502-based machines, yet we have barely pushed the limits of 68000 machines."

It can't be done. You can't start an ambitious software company these days without making a venture capitalist the controlling owner. You can't launch your products on a shoestring—you need advertising megabucks to make a proper market splash. Don't expect to be in the black inside a year, or even have something ready to sell by then. If you think your product development will keep on schedule, you've been breathing too much vapor. This is the current wisdom about the software business.

Don't tell that to Tom Maremaa, a software company founder who broke all the rules and got away with it.

Maremaa, who was once a tennis pro, had the dream of creating the ultimate computer tennis game simulation. When he found a half-finished tennis game for the Macintosh he purchased the code, quit his job as product manager for a software publisher, and started Infinity Software in February 1986 with $20,000. He masterminded the completion of his program and then borrowed $30,000 more when the product, *Grand Slam Tennis*, was ready to market in July.

Business gospel notwithstanding, the gamble succeeded—sales took off and the game is now number three on the Macintosh best-seller list in the entertainment category. Infinity used the proceeds to finance more products, and now expects to do a million dollars' worth of business by the end of this year.

Maremaa attributes Infinity's unusual success to having hot products, the right timing, and a talented team. The element of luck was there too. Infinity scored a major coup by beating out its tennis-game competitors and getting the market to itself by porting *Grand Slam Tennis* to the Amiga in time for the 1986 Christmas season.

"Our business strategy is to build a product development and publishing house with many products running on various machines," Maremaa explains. "It takes us six to nine months to do a program well. We are trying to push our software to the state of the art, the technical edge. Software has gone as far as it can with 6502-based machines, yet we have barely pushed the limits of 68000 machines.

"We are doing a combination of acquisitions and in-house development. We feature the authors, but teamwork is also a necessary part of product creation. Creating good software is like composing music—you have to know your instruments and you have to know your audience. When the two of them connect, it makes the weeks and months of midnight programming worth it."

AMIGA PUBLISHING WITH SHAKESPEARE

A fully-featured desktop publishing system for under $2,000? One that can print pictures in color as well as black and white? Infinity has announced just that—based on *Shakespeare*, the new DTP program for the Amiga, due to reach the market this summer.

Infinity sees the program as a breakthrough in the low end of the market: take an Amiga with 512K RAM, *Shakespeare* at $225, and a dot-matrix color printer, and you can have a desktop publishing system for **under $2,000. Go first-class with a hard disk and an inexpensive laser printer, and the system would be in the neighborhood of $3,000. An equivalent Macintosh-based system with *PageMaker*, by comparison, costs over $6,000 and doesn't offer the option of color printing.**

"We are trying to make the system an attractive and affordable tool for the neophyte, as well as offering a powerful enough product to appeal to desktop publishing professionals," says Maremaa. "Graphic artists and advertising shops will appreciate being able to do their 'comps' (mockup presentations) in color."

The package includes templates for standardized page-layout situations and also has a library of clip-art. The company promises that users can work with any set of *Deluxe Paint* images and print them in their correct colors. Pictures can be cropped, shrunk, or blown-up, and text can flow around the graphics or be superimposed. Documents can be any length, and images can be any size, limited only by RAM.

Infinity boasts that *Shakespeare* is designed to take advantage of Amiga's multitasking abilities. It can set up windows to do text editing and display graphics simultaneously, and can handle input from any Amiga word processing program, thanks to the Amiga's interchangeable file format. According to Infinity, this offers a significant advantage over Macintosh or PC-based systems: "You can't do this kind of multitasking on a Mac or IBM—the IBM-PC *PageMaker* has 15-20 filters just to bring documents into the program."

One tradeoff the company made in the interest of economy was the decision not to support PostScript. This means that advanced PostScript features such as half-tone pictures and customizable font sizes are not available with *Shakespeare*. For fonts, you make do with the ones that come with your printer (which will give the better resolution on printouts), or with purchased or public domain **font sets for the Amiga. To give gray shading, the program uses "dithering," and can achieve 16 levels of gray at 75 dots per inch.**

Shakespeare runs on the Amiga 500, 1000 and 2000. It does not require a hard disk (it runs better with one, though), and will support, thanks to Amiga's built-in interface, "just about every printer out there, including color printers."

The program was developed in-house by Infinity, and the cost of development was paid for by the profits from *Grand Slam Tennis*. It was team-designed by Randy Spencer and Mike Sokolewicz with input from Maremaa. Infinity is working with Commodore to establish standards for desktop publishing files.

THE ADVANTAGES OF AMIGA DEVELOPMENT

Infinity is focusing on the Amiga and Macintosh markets, with a particular enthusiasm for the Amiga. Says Maremaa, "New programs are welcome. There is an excitement with the Amiga—the user base is more intelligent and sophisticated. People have graduated to the Amiga from Commodore or the PC realm. It offers superior speed, color, graphics and multi-processing. You can offer quality software for affordably-priced hardware."

The Amiga offers an unusually friendly environment for software development. "Commodore has established a file format standard which removes the hassle from file importation," Maremaa points out. "You have one standard for speech, sound, music, and graphics. The Amiga supports just about every printer, and does it in a program independent

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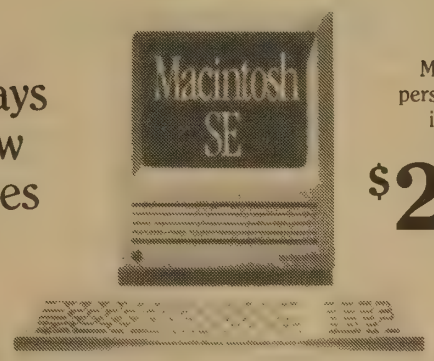

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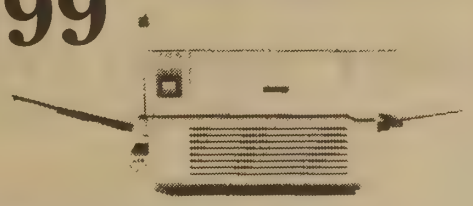

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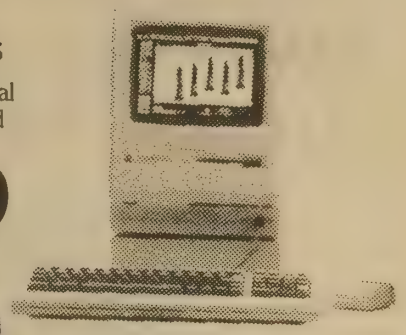

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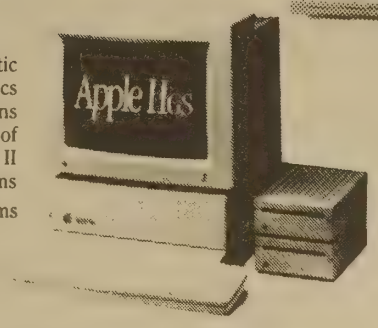

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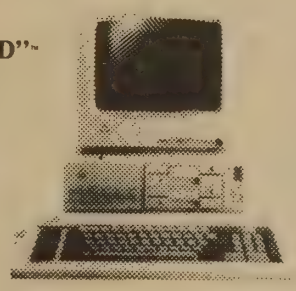

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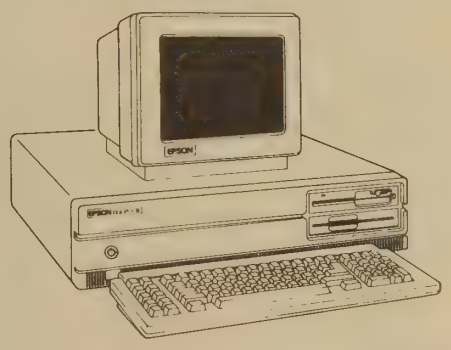

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INFINITE POSSIBILITIES

The company started in Tom Maremaa's garage, "then it moved into my car—I was always having to drive to the programmers, lawyer, and graphic designers." After Infinity outgrew the sedan, Maremaa found a cheap-rent space in the East Bay Emeryville flatlands and the company grew rapidly. They now have seven people in-house and seven programmers off-site. Infinity's imaginative packaging design and advertising is done by Porter Maremaa, a design agency owned by Tom's wife Mollyanne Maremaa.

Maremaa feels it is important for software developers to have a vision of what they are doing, because "software products are 'hand-crafted' at all phases—design, packaging, and marketing. It is essential to have the right talent, creative and technical, on board."

What's next for Infinity? That's a big secret, but Maremaa did allow that they were working on an artificial intelligence-based expert system, due to be released late in the year. They are also interested in looking at other possibilities in the expert system area, as well as other inspired creations.

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Beyond Tennis— Other Infinity Products

Tennis has been good to Tom Maremaa, first as a champion in the junior tournaments, then as a software entrepreneur. "*Grand Slam Tennis* established our reputation and launched the company," says Maremaa. *Grand Slam Tennis* puts the player in the environment of a big-time tennis match, with your choice of clay, grass, or hardcourt. You use the mouse to control the moves of your player onscreen, while your computer opponent may be one of four persons of varying skill and style. With the built-in variables of court conditions and player personality, the game involves strategy as well as mouse-button reflexes.

Grand Slam II, a two-player version, is in the works and projected to be out on the market by the end of the summer. In addition to playing against the computer as you do in the current version, armchair athletes will be able to challenge others via modem. (You can't play face-to-face, because the computer supports only one mouse.) It will cost $59.95 and run on the Mac and the Amiga.

Galileo, a planetarium simulation and astronomy learning tool for the Amiga 512K, was Infinity's second new product. Maremaa heard about it through the Amiga Users Group, was intrigued and acquired the rights to publish it.

The author, Mike Smithwick, is a computer scientist and astronomer working at NASA. His product was little more than half-done when Infinity got their hands on it, and together they put the final polish on the product, which is undeniably gorgeous. When the program starts up, you see the sky fading from twilight blues into midnight black, with a dazzling celestial show arrayed before you. You can provide the program with any date, from 400 years ago to 400 years into the future, specify any hour and minute within that day and any viewpoint on earth, and you will see the appropriate sky. You can also bring into view a vivid telescope closeup of the moon or any other object in the solar system.

One feature sure to be appreciated by dedicated sky-watchers is called "what's up," giving you showtimes for tonight's events. You get sunrise and sunset times, information about the moon, planets, and constellations, and any anticipated meteor showers. Galileo was introduced in March 1987, sells for $99.95, and sales are taking off like a rocket ship.

Go is the first, and currently the only, Macintosh version of the 4000 year-old classic Japanese board game. It is scheduled for release right about now, and sells for $39.95.

You can play against the computer or with a human opponent via modem (the only way to get around the two player/one mouse impasse). To liven up the potential dullness of a board-game screen image, Infinity has included the sound effects of clicking stones and can display the board in 2-D and 3-D formats. Players can choose board sizes suited to their level of expertise from small boards for beginners up to large ones for the masters.

Is there a market north of the Rio Grande and west of the Atlantic for a soccer game? Infinity thinks so. "Soccer is immensely popular in Europe and Latin America, and we see a surging interest in the game in the United States," according to Maremaa. "It is a coming sport—not as dangerous as football, and it's cheaper to play." Infinity is offering *World Cup Soccer*, at $49.95, for the Macintosh. Designed to challenge your wits as well as your reflexes, it incorporates the soccer strategies of various world champion teams. You can play against the computer or with a modem-friend. (Infinity Software, Ltd., 1144 65th St. Suite C, Emeryville, CA 94608, 415/420-1551.)

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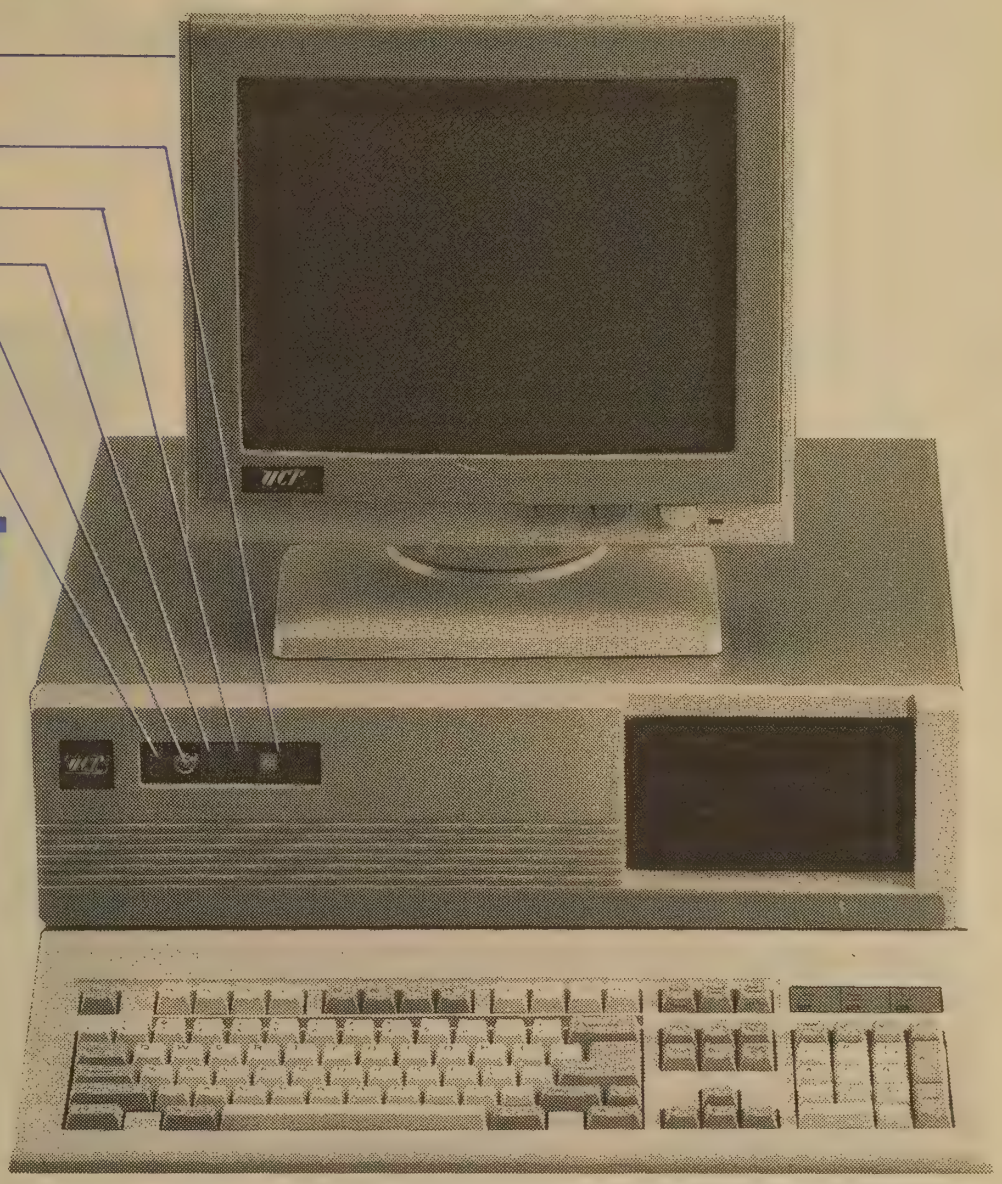

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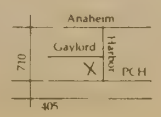

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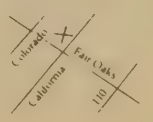

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EGA
The Bewildered User's Guide

By Ed Kahn

The era of color displays is now upon us. Despite the lack of widespread use of color printers, computer users are increasingly turning to color monitors as an aid to working efficiently. In the last couple of years, since IBM's introduction of the EGA (Enhanced Graphics Adapter) standard, both software and hardware have been developed increasingly with color display in mind.

In the days before EGA, color was available, but the extra cost involved in buying a color monitor hardly seemed worth it for most users whose primary task was working with text. The display was of such poor quality that we could reasonably assume that users of the standard color display on an IBM or clone either did little work with text or soon found themselves going blind.

Monochrome display did all you needed for the creation of text. But with the introduction of EGA, the computer world began to move inexorably toward color displays. Initially, it was much too expensive for most computer users to switch to EGA unless they had a compelling need for high definition color display. There were many costs: the initial expense of a new EGA board—over $700 in the early days; the cost of a new monitor designed to accommodate the output of the EGA board, and finally software that could take advantage of the higher resolution made possible by the new board and monitor. Much of the older software was incompatible with the new higher definition output.

In time, however, the inevitable lowering of cost, standardization of software, and more sophisticated technology have begun to establish EGA as a viable standard. For the first time, color displays of text offer a resolution just as clear as the old monochrome displays. And new software is finding more ways to use color so that working at a monitor is easier and more efficient.

Despite the appeal of EGA, the number of products available and the need for the whole computer system to be integrated make it into a jungle in which you can easily get lost. It is my purpose to offer some non-technical guidelines to help you enter the rewarding but confusing world of color display. There are three elements in the color equation: monitor, graphics adapter board, and software. If the elements are incorrectly matched, the equation doesn't balance.

MONITORS

There is a wide range of choices in monitors. The least expensive option is a standard EGA monitor, available for somewhere in the neighborhood of $450. This monitor will display the output from an EGA board, but will not accommodate any other output. It is because of this limitation that some users continue to use their monochrome monitor as a second monitor with their system—provided either that they have a video board that will deliver a signal in more than one mode or they leave their old board in the computer. This is a cumbersome arrangement requiring a lot of desk space, but it insures that all of the software that you have been using will continue to work. Today, with new boards and multiple signal monitors, it is seldom necessary to use more than one monitor.

A more expensive option, but perhaps cheaper in the long run, is one of the displays that will work with a wide variety of video outputs. The pioneer in this field was the NEC Multisync monitor, a 13″ color monitor which claims the ability to accept output ranging from an older color board all the way up to a Professional Graphics Adapter (PGA), which is still so expensive that its use is pretty much limited to CAD/CAM applications.

Although the monitor is expensive, it has two advantages. First, it is capable of accepting output from a wide range of graphics adapter boards. Second, it is flexible enough to have a life even if a newer graphics standard takes the place of EGA. A major limitation of the NEC monitor is its inability to handle output from a Hercules monochrome board. It can, however, work with a standard IBM monochrome board because this standard is compatible with EGA.

The Sony Multiscan monitor works with virtually any graphics board currently on the market and has the advantage of a smaller dot pitch not offered by the competition.

In the wake of NEC's success, several other versatile monitors were introduced. Thomson, Sony, and other manufacturers soon offered models that would accept output from a wider variety of graphics adapter boards than the NEC. Some of these newer versatile monitors would also work with Hercules output.

Of these monitors, the Sony Multiscan (CPD-1302) is my favorite. Not only will it work with virtually any graphics board currently on the market (and probably newer boards yet to be introduced), but it has the significant advantage of a smaller dot pitch that none of the competition offers. Dot pitch is the measure of how wide the line of the image is. In working with text, I find the .31mm dot pitch which the NEC and most standard EGA monitors use a bit too fat for my taste. Monitors that use this size letter simply are not as clear as a good monochrome display. But the Sony, with a .26mm dot pitch, offers every bit as clear an image as a good monochrome monitor.

So, finally, there is virtually no tradeoff in using a color monitor for the creation of text. And there are a number of advantages. In word processors, error messages can have a different color, menus can be composed of different colors to lead you quickly through procedures, and highlighted words in spelling checkers can take advantage of the range of colors. The only disadvantage I have found is that both underline and bold are shown on screen as colors rather than as the attributes

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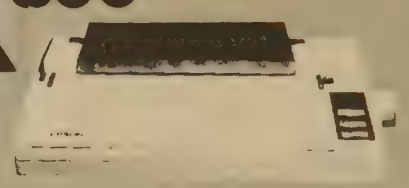

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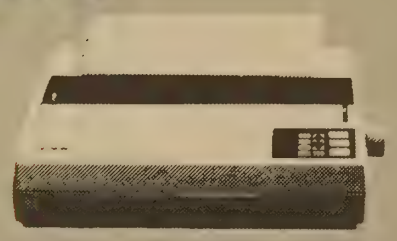

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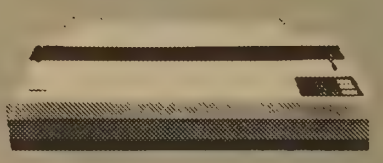

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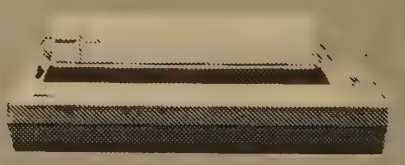

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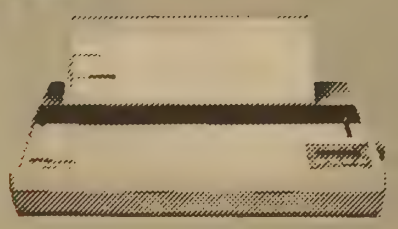

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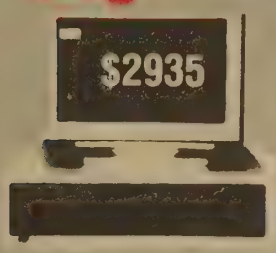

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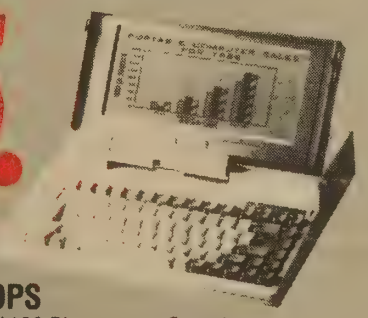

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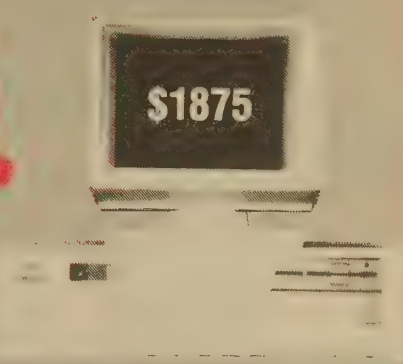

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themselves, so if you choose to both underline and bold a word, it may not be properly reflected in the display.

The advantages of using a color monitor in the creation of spreadsheets and databases are more obvious. Negative numbers can have a different color, borders can be easily distinguished, and column headings are easily recognized.

GRAPHICS ADAPTER BOARDS

The second component in the EGA equation is the graphics adapter board. Although the original IBM EGA board worked only with an EGA monitor, clone boards that could be set to utilize numerous graphics standards ranging all the way from monochrome and Hercules to standard color and EGA soon came to market. These boards offered the advantage of greater flexibility—especially if you used two monitors—and were usually less expensive than the Big Blue board. These generic boards are usually available for $200–300.

The next step in the evolution of color boards was the introduction of auto-switch boards pioneered by AST, Paradise, and Vega. These boards are available for around $300-400. They work with any software, and they're capable of knowing which software you're using and automatically switching to the correct settings. The advantage of these boards is enormous, especially if you frequently switch between applications that utilize different graphics standards. Memory resident programs that call for graphics standards other than the primary program's also work smoothly with these nifty boards. Although the auto-switch cards will accommodate any software, you are still limited by the monitor itself. The boards, however, can be set to work with any of the monitors. If you set the board to work with a monochrome monitor, it will automatically select standard monochrome or Hercules output, depending on the software. But if you then run EGA software, it will not display. These boards are especially suited to the multiple signal monitors as, with the exception of the NEC Multisync, they really can accommodate all software configured for any standard.

A final category of graphics adapter board has now come on the market. These boards boast that they will run any software on any monitor. Of course, it is not possible to create more definition than a monitor can support, but these boards make it possible to use any software that you already have and also to purchase new software that has been designed for use with EGA monitors.

The first of these boards that we examined is Genoa's Super EGA. This board is specifically designed to run on a multisync monitor. The benefit is that you can run any software with a multiscan monitor. It is necessary, however, to use the software provided to switch between modes. If you have an application written to the Hercules standard, you must go to the software menu provided and chose the Hercules mode. After that, the application will run perfectly.

ATI Technology's Small Wonder EGA board will run any software on any monitor. The board is also capable of automatically determining which standard the software is written to and configuring itself accordingly.

The advantage this board offers is that you don't need to have two monitors. The selection of modes is easily done through the software provided. The Genoa board is a perfect match for the versatile multisynchronous monitors that work with any of the graphics boards on the market. If you switch to a monochrome mode, the multiple signal monitor will respond as if it were a monochrome monitor and provide all of the definition and detail that the appropriate monitor offers. If the next application is written for EGA, simply switch through the software to that standard and you're back in business. This board-monitor combination provides a match which will run any software you may have.

Although this board lacks the convenience of auto-switching, it has several enhancements. Normal EGA resolution is 640 x 400. The Genoa board permits you to increase this resolution for certain applications. Users of *AutoCAD*, *GEM*, and *Windows* can increase the resolution to 640×480 by following the installation instructions that come with the Super EGA. *Lotus* users can increase the display from the conventional 80 column by 25 row to 132 column by either 25, 29, 32, or 43 rows. This is also accomplished by following the installation instructions provided. If you have use for these applications, this board may well be your choice. However, keep in mind that it lacks the ability to auto-switch between the different standards.

My favorite board is ATI Technologies' Small Wonder. This board claims to run any software on any monitor. In addition, the board is capable of automatically determining which standard the software is written to and configuring itself accordingly. By far, this is the most versatile of the boards.

In simple terms, the advantage of this board is that it will run any software on any monitor. Got that? It means that if you have an old monochrome monitor, you can now run the newest EGA software. Obviously you will not get a color output, but your software will run with as much definition as the monitor can offer.

The board will work with monitors supporting any of the IBM graphics modes. Not only that, it will also enhance the display in some cases. For instance, if you are running a CGA program on an EGA monitor, it will convert the 8×8 pixel formation text into the higher density 8×14 output of EGA. And because of the board's ability to automatically switch between software standards, it is possible to use combinations of programs. When I first converted to EGA, I found that I was no longer able to run my version of *Sidekick*, which was not set up for EGA. When I would call up *Sidekick* in the middle of an application, the screen would go blank because *Sidekick* was set up only for CGA. When I installed the Genoa board, *Sidekick* would run, but only if I used my word processor in a CGA mode. With the Small Wonder, however, *Sidekick* works perfectly, and, although it is an old CGA version of the software, the display has the same high definition as my EGA word-processing software because of the board's automatic translation to higher definition.

If you have an old CGA monitor, the ATI Small Wonder will interlace EGA output so that, although the output will not be as clear as that offered by an EGA monitor, it will have a good deal better definition than a standard CGA output, because the interlaced output doubles the scan to fill in the blank spaces in the CGA output.

The Small Wonder also offers the 132 column option for *Lotus*, *Symphony* and *WordStar* users. While the installation of this feature is straightforward enough for *Lotus* and *Symphony*, using it with *WordStar* requires a patch, and I suspect it is not as easily installed in *WordStar*'s newest version. However, the manufacturers of all these boards are constantly updating and changing the product to remain competitive. Since I received my version of this board, the company has issued new documentation and made several changes in the product.

For the user buying a new system, it's clear that if you want a color display, you should move directly to a system that supports the EGA standard. The choice then becomes whether to purchase a multisynchronous monitor or a less expensive EGA unit. Multiscan monitors are capable of considerably higher resolution than is demanded by the EGA standard. In terms of the display, there is little advantage unless you utilize some of the features offered by boards like Genoa's Super EGA. If you do not need that resolution, its presence is merely a hedge against your future needs or whatever standards the future may bring.

After you've decided which monitor suits you best, you must still choose a graphics adapter card. In practical terms, there is little difference between one of the many auto-switch graphics boards. The ATI Small Wonder, however, has the advantage of offering higher resolution on older CGA software displayed on an EGA or multiscan monitor plus the ability to display *Lotus* spreadsheets in 132 column mode.

For the buyer who is upgrading his system, there is little question in my mind that the best buy in cards is the Small Wonder, because it does not require you to change your monitor at the same time. You can put in this card and run all of your software—both old and new—and when you are able to upgrade your monitor the card will still work. In the meantime, you will have removed the limitation of being tied to a single graphics standard. □

Resources:

EGA Wonder $399
ATI Technologies, Inc.
3761 Victoria Park Ave.
Scarborough, Ontario
Canada M2H 3M6
(416)756-0711

Super EGA $499
Genoa Systems Corporation
73 E. Trimble Road
San Jose, Ca 95131
(408)432-9090

Multiscan Monitor $975
Sony Corporation
Sony Drive
Park Ridge, NJ 07656
(415)467-4900

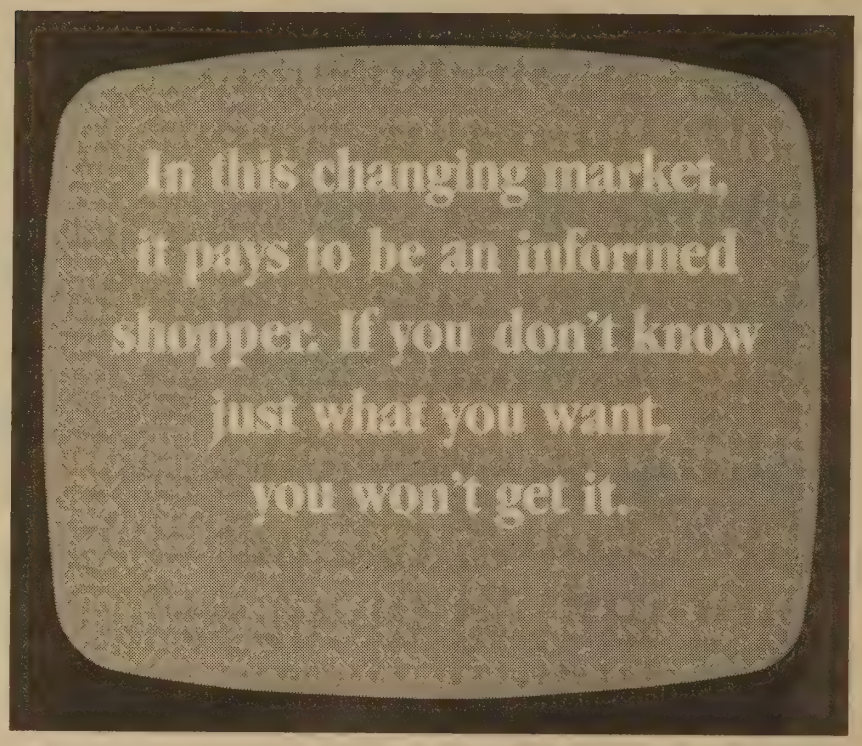
Display Standards In A Changing World

Questions To Ask On Your Shopping Expedition

By Birrell Walsh

Rumor has it that true VGA clones — duplicating the display standards of IBM's PS/2— will be available by fall of 1987. In the meantime, we can duplicate many of the functions of the VGA with third party boards and monitors—at a fraction of IBM's prices.

In this changing market, it pays to be an informed shopper. If you don't know just what you want, you won't get it. The following are some questions we would want answered before shelling out for VGA-imitators.



GRAPHICS BOARDS

Let's assume you are starting from scratch, and want to buy a good color system. You don't want to pay the entire family fortune, but you will spend a bit. Here are some questions to ask of any vendor whose video board you're thinking of buying.

Is The Resolution High Enough?

Resolution is the fineness of the grain in the picture. It is the number of dots in a horizontal line and the number of horizontal lines in a screen, expressed as a product; 320 × 200, 720 × 350, and 800 × 600 are common examples. If you want to do high-quality graphics work, you need the higher resolution. For text-only work, the resolution of the Hercules-compatible (720 × 348) or EGA boards (640 by 350) is more than enough.

Will The Printed Paper Look Like The Screen?

You may have noticed that what you see on the screen is often *not* what you get on the printer. You draw a duck, tall and handsome, with a noble, long neck. Your printer gives you a short, squatty dwarf-duck. The problem is that the picture cells ("pixels") are not square in all graphics modes.

You will get square pixels if the number of dots per horizontal line equals 4/3 times the number of vertical lines. This is "aspect ratio." This is because most monitors, like television sets, are four units wide to three high: an aspect ratio of four to three.

A 640 by 480 board has a four-by-three aspect ratio. It will have square pixels, and graphics will print as they appear on the screen. The same is true of 1024 by 768, 800 by 600, and 1600 by 1200. You do not get square pixels with the 640 by 350 EGA color board, the 720 × 348 Hercules monochrome board, nor with the 320 by 200 CGA board.

How Many Colors At 640 × 480?

The more colors available, the higher the apparent resolution. The human eye is designed to calculate shape and edge from color, even if other detail is missing. You should make sure to get at least 16 colors available at a time for any serious artistic or presentation graphics.

Does The Board Produce Both Analog and Digital Outputs?

Digital video has a limited number of steps in brightness and a limited number of colors. Analog video has (potentially) unlimited numbers of brightness steps and colors. Both the Mac II and the much-admired Amiga use analog video. So does IBM's new VGA standard. It is here that present clone boards fall down—most of them do not produce analog images. Most of them support only 16 colors. The clone analog boards should arrive about Fall.

Is There A Driver For Your Application?

If you buy the board, and an appropriate monitor, you ought to be able to use your favorite application with it, right? Wrong. The ability to use a certain graphics standard requires software (called a "driver") written for that purpose. The board manufacturers usually provide software to run favorites like *Lotus 1-2-3*. For other applications, you must ask the board manufacturer if your application is supported. If the board manufacturer doesn't support it, call the software company. They may have built in support for the graphics standard you are considering, or they may be about to issue an update (for how much, please?) which will support this graphics standard.

Does The Board Support Most Standards?

Some applications insist on a Hercules, CGA, or EGA board. Can the board you are thinking of buying emulate those older standards? Even better, will it detect what standard the application desires, and automatically switch to that standard?

Does It Have A TI 34010 Or An Intel 82786 Chip Aboard?

These are two chips that can handle graphics for you. Having one of these chips—or better, having both—means that the central processor of your computer can say "paint me a circle" instead of saying "Turn on a pixel at 325, 401. Now turn one on at 326, 400. Now . . . " These graphic chips speed up screen painting many, many times. They are the forerunners of the next generation of graphics.

MONITORS

Is The Monitor Capable Of Many Different Frequencies?

NEC invented a new kind of monitor with its Multisync. It was so successful that people call other monitors that imitate the Multisync by the same name, even though it is an NEC trademark. A multisync monitor switches frequencies to match what the graphics board is producing. If the board is generating a CGA signal, the monitor acts like a CGA monitor. If it is getting an EGA signal, it acts like an EGA.

Each graphics standards generates a characteristic "horizontal frequency." Here is a list of frequencies for various graphic standards, courtesy of Genoa Systems:

CGA	**15.75 KHz**
Hercules Monochrome	**18.75 KHz**
EGA	**21.8 KHz**
VGA 640 x 480	**30 KHz**
800 x 600	**35 KHz**
1600 x 1200	**54 KHz (interlace scan)**
1600 x 1200	**76 KHz (non interlace)**

Copyright ©1987 by Birrell Walsh. All rights reserved. *Birrell Walsh has been a video technician at a major television station for 17 years, looking cheerfully at good monitors and balefully at bad ones.*

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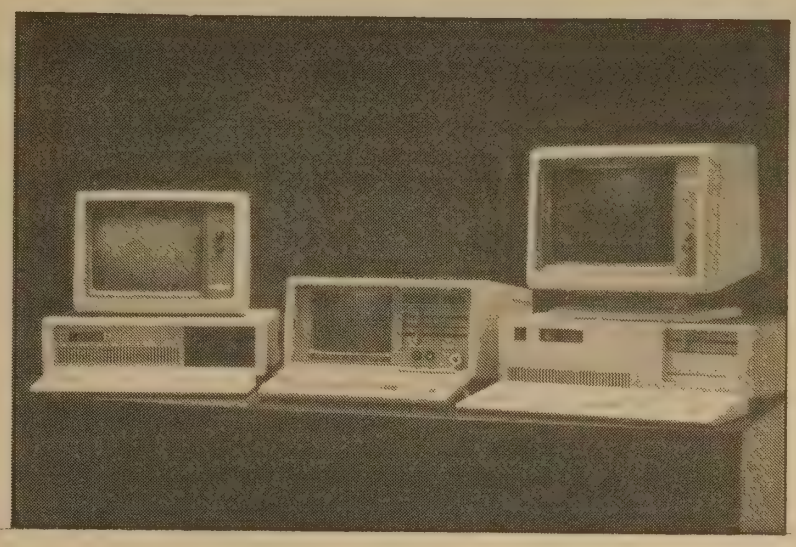

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Keyboard: 101-Key IBM RT-Style Keyboard with separate numeric keypad, cursor keys, and 12 function keys.

I/O Interfaces: RS-232C Serial port with male DB-25 Connector; Parallel Port with female DB-25 Connector.
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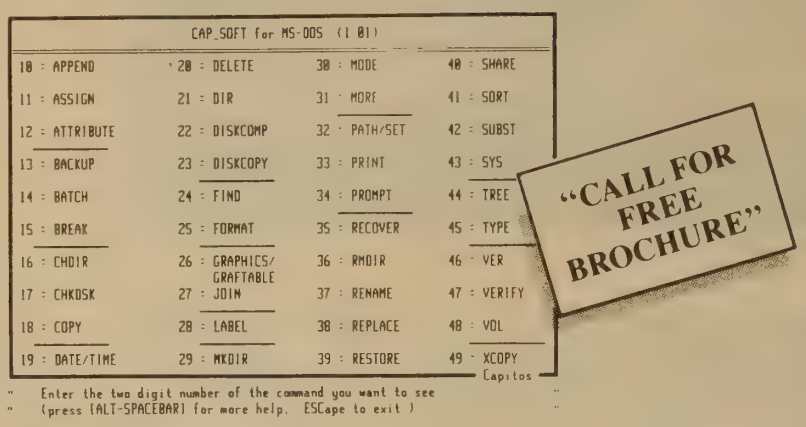

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The board manufacturers usually provide software to run favorites like Lotus 1-2-3. For other applications, you must ask the board manufacturer if your application is supported. If the board manufacturer doesn't support it, call the software company—they may have built in support for the graphics standard you are considering.

To use one of these standards, you must have a monitor which will accept the horizontal frequency in question.

Is It Autosync?

That means, does the monitor automatically switch to the frequency that the board is producing? Again, this is a trademarked word (Paradise Systems created it with their Autosync Board), which is being used generically.

What Is The Dot Pitch?

You get finer resolution with a smaller dot pitch. Accept no monitor with a dot pitch greater than .31 mm.

Can The Monitor Accept Either Digital (TTL) or Analog (RGB) Inputs?

The IBM standard uses analog inputs. Most current third-party boards offer only TTL output. When future boards offer analog outputs (with all those extra colors), you don't want to have to buy a new monitor.

Are The Controls Accessible?

You will want to adjust brightness, hue, and contrast from time to time. Is it easy to get to the controls, or do you have to crawl around to the back?

Is There Any Flicker?

While the monitor is running a high-resolution color application, look at it out of the corner of your eye. Peripheral vision is more sensitive to flicker than is central vision. If you see flicker, don't buy the monitor. Flicker will give you headaches and drive you mad in short order.

Do You Like The Way The Picture Looks?

You will be looking at this monitor for hours. Insist on trying it out. Try it with text. Is the text easy to read? Then try it with colorful graphics. Do you like what you see?

The monitor is where the computer system meets your nervous system. Compatibility is even more important here than in hardware-to-hardware connections. If you don't like what you see, don't let anybody sell it to you. Visual comfort and delight should be your goal.

FOR BOTH BOARDS AND MONITORS

Can You Get Information And Support From The Manufacturer?

In writing this article, I called and spoke to representatives of Genoa Systems and Paradise Systems—video-graphics board makers—and NEC—they make the famous Multisync monitor. I also tried to talk to IBM. Genoa, Paradise and NEC had people available to talk to, right now, and those people knew what they were talking about. NEC had a toll-free technical line, where a technician skipped lunch to get an answer to my question.

IBM had only referrals. After two calls, I was referred by a polite but stone-ignorant clerk to my local dealer. My local dealer knew only what he could find in printed material—published by IBM.

In buying a product, you should ask yourself what kind of treatment you will get if you have a problem with the product.

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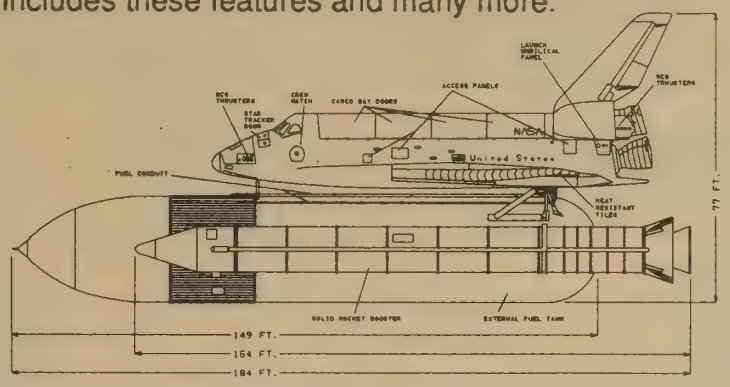

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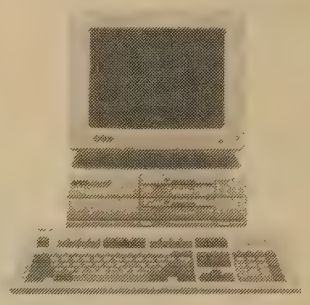

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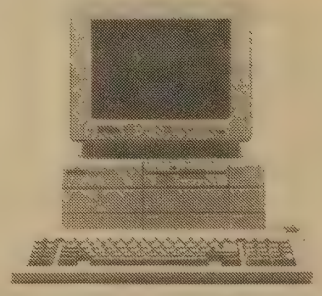

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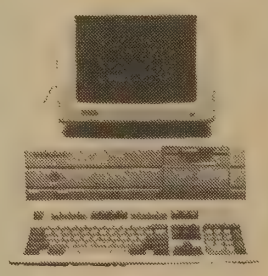

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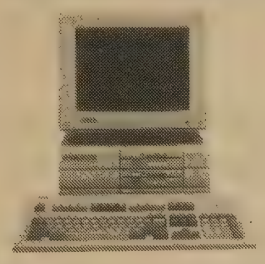

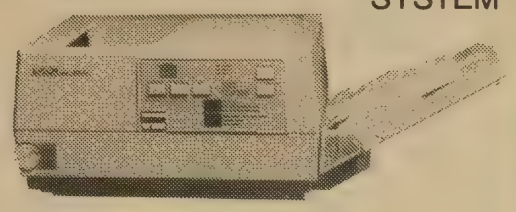

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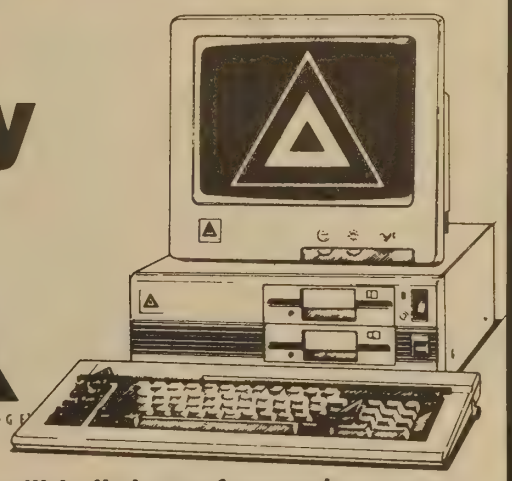

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PERSPECTIVE

IBM Graphics The Right Way

By Birrell Walsh

Perspective, by Three D Graphics, is a rare package that not only presents business and scientific data with flair and drama, it lets you have fun in the process. It makes absolutely elegant graphs and turns opaque tables of numbers into understandable, clear presentations. It is a delight to work with—I played with it for hours.

When this three-dimensional graphing program loads, the first thing you see is a sample graph. It seems fairly fancy, and it is, but *Perspective* is so well constructed that you will be designing similar graphs before an hour is past. It has the friendliest interface I've seen in an IBM program.

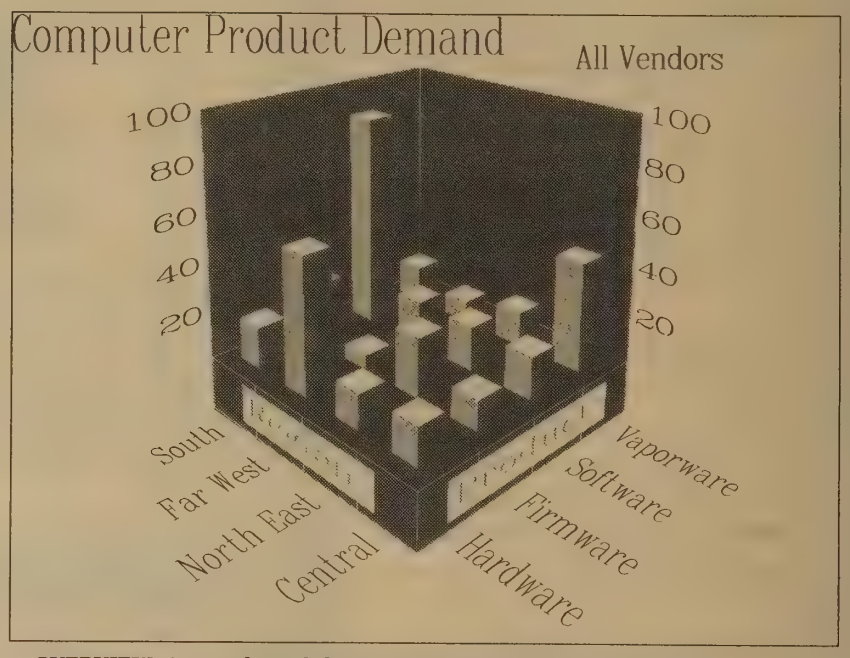
Perspective gives you 32 different pre-made three-dimensional graphs to choose from. Each of those can be displayed in 16 different "viewing angles"—from above, sides, distorted angles, and so forth. That makes 512 ways of displaying the same information in three dimensions. Then each of those 512 views can have the graph and the parts of the background individually painted with any of 178 different patterns.

As the Macintosh is a mouse machine, so the IBM is a keyboard machine. I never really thought a keyboard could operate a graphics program, but *Perspective* has changed my thinking. When you set up the program, it asks you whether your function keys are vertical, along the side of the keyboard, or horizontal and along the top of the keyboard. When the program operates, you find that you have a graphic screen with images of your function keys—in the same position as on your keyboard. The menus on *Perspective* are all graphic. The authors of the program allow you to change the graphs, the viewing angle, the patterns with which the background and foreground are painted, and all these choices are made from the keyboard. When the choice is continuous, as in the rotation and translation of graphs, you can choose between stepped jumps, controlled by the arrow keys, and continuous motion, which you stop with a key when the graph is where you want it.

PICTURES WORTH A THOUSAND NUMBERS

I tried out *Perspective* on a set of quite imaginary data that show dollars spent on different products, by region. The purchasers spend it on software, ROM and CD-ROM (firmware) or hardware. Some of them don't buy now: they decide to buy just as soon as Operating System/2 actually comes out. They have decided on vaporware, and the money goes into the bank until the vaporware precipitates.

The data make a table of sixteen entries—four categories by four regions.



1. OVERVIEW. An unadorned three-dimensional chart that looks at all the available data. Notice the three peaks: West likes hardware, South likes software, and Central likes vaporware.

Computer Product Demand
All Vendors
Millions of Dollars

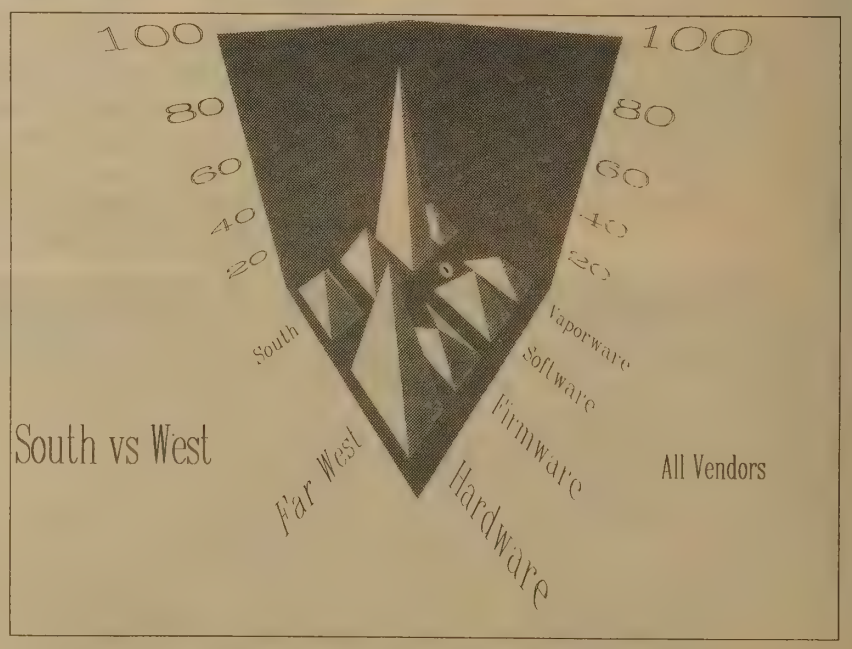
	Hardware	Firmware	Software	Vaporware
South	17.00	25.00	88.00	15.00
Far West	55.00	6.00	18.00	9.00
North East	14.00	24.00	18.00	14.00
Central	15.00	12.00	17.00	44.00

I never really thought a keyboard could operate a graphics program, but Perspective has changed my thinking.

Not very interesting, eh? In less than one hour I made four graphs to dramatize the data, and still had time to make two other graphs in the same hour.

Figure One staidly shows all the data. There are 32 choices for "risers"—the part of the graph that shows the actual data. In this graph I used rising square bars, which let you see most of the data at once. Because some of the data hide behind others, you need to view the graph from a fairly high angle. *Perspective* provides sixteen pre-made viewing angles, among which you can choose with a keystroke. You choose them from a menu which actually shows all the views, and select by moving with the cursor controls to the view you like and hitting return.

Figure Two compares demand in South and West, highlighting the South's interest in software, and the



2. SOUTH VS. WEST. Comparing South and West, highlighting the South's interest in software, and the West's interest in hardware. Other sales types are made insignificant. The chart is on an inverted background.

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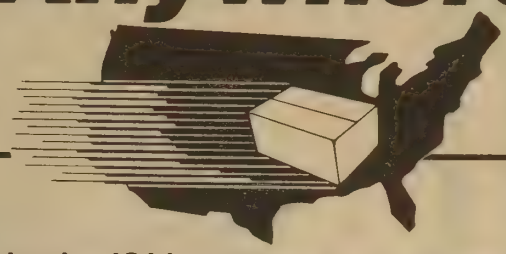

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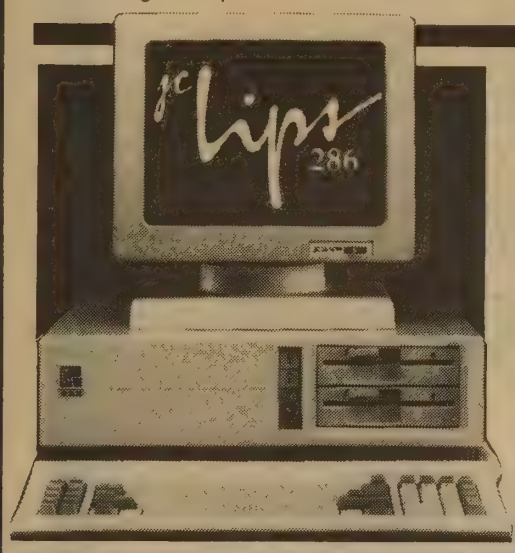

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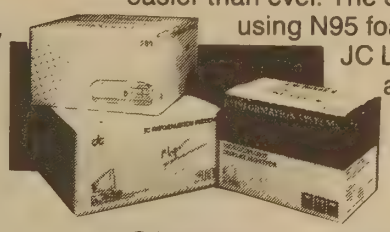

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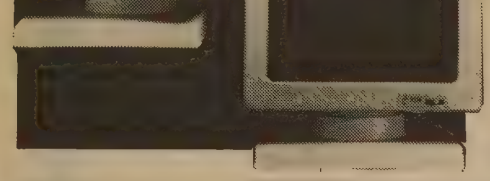

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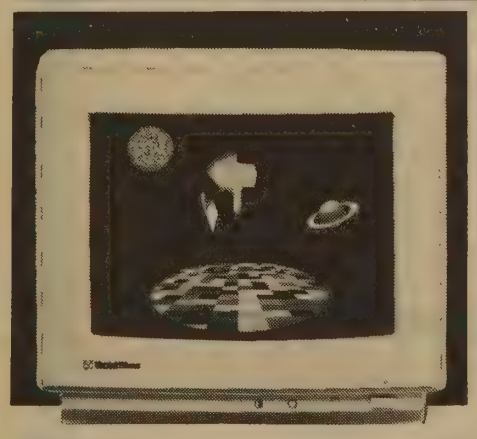

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Quad Mode EGA Card built by Paradise for JC

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On The Firing Line

How To Reorganize Your Hard Disk For Better Performance

By Stephan Wickham
and the Diamond Software Technical Team

If you've used your hard disk at all, odds are that it's not as fast as it was originally. From the first moment that you start to use a hard disk, its performance begins to deteriorate; the more use it gets the more slowly it is likely to react. Also, surprisingly enough, even if a hard disk is brand new, it might not be performing at its maximum.

This speed penalty can be kept to a minimum if you overcome the factors that cause it. You will be able to make your hard disk as speedy as when it was new, or maybe even speedier, if you follow the suggestions made here.

The Problem

Although the loss of speed has some mechanical causes, it is not itself an indication that the drive is wearing out. Disk drive mechanical parts seldom give out under normal use, nor is there likely to be any mechanical reason for hard disk sluggishness. Rather, the decrease in performance is the result of an interaction between PC-DOS (MS-DOS also) and the hard disk head actuator unit (the mechanism that moves the read/write head). Most of the performance loss is a result of the manner in which PC-DOS organizes your hard disk and manages your files.

If you reorganize your files to enhance the interaction between the operating system and the hard disk, you will make your hard disk access data substantially faster—so much faster that you will easily see the difference when you load programs or information files.

One of the major causes of hard disk speed degradation is DOS's technique of packing files onto any disk (hard or floppy). While the files on your disk vary widely in actual size, DOS breaks each file into a group of fixed length clusters. While the precise number of bytes in a cluster varies with each disk type, format and DOS version, DOS always deals with files packed into standard packets. An individual file can be stretched over dozens or even hundreds of such clusters. The slowdown occurs because DOS does not require that the clusters making up a single file be physically contiguous on the disk surface. The result is that, when assembling a file, DOS has to command the hard disk head assembly to move to many different locations on the hard disk.

For this to make sense, it is important to understand how the system works. PC-DOS uses a cluster map on the hard disk (while you are shown a file directory on the screen by the system); this operating system map is called the file allocation table (FAT), and is used to keep a trail of which clusters are used by which file. Because the FAT is used to control the entire usable data storage area of a disk, two identical copies are stored in case one is damaged.

In choosing which clusters are to be used, PC-DOS version 1.x and 2.x follow a simple rule whereby the first available cluster at the beginning of the disk is always the next one used. On a new disk, clusters are allocated one after another, and clusters are adjacent to each other. When a file is erased, however, its clusters are detached for reuse. These freed clusters will be the first to be used by PC-DOS for storing new clusters, because they previously held data and will automatically be near the beginning of the disk.

PC-DOS 3.x is not as inflexible, and will typically look, starting at the beginning of the hard disk, for a contiguous set of clusters the same size of the file as a file storage area. Therefore, as PC-DOS fills in the areas left by erased files, the clusters allocated to new files may come to be scattered all over the place. When this happens to a file, we say that it is "fragmented."

The Solutions

To have a speedy system that offers greater chance of file recovery, it is necessary to have a hard disk with contiguous clusters. Although PC-DOS has no built-in method for rearranging clusters into a sequence, you can do it by using either software made for this purpose or by going through a backup procedure onto tape, floppy disk or another medium.

Regardless of the backup technology that you use, the main point to be aware of is that you should make a backup copy of your file that can be restored "file by file," rather than a hard disk mirror copy (IMAGE). The PC-DOS COPY command backs up file-by-file automatically, though it will not automatically switch subdirectories. Also, if you are backing up onto floppies, you will have to be careful about how many files can fit on one disk. You should have about 25 360K floppies for every ten megabytes of hard disk. You may need to use a third party program for hard-disk-to-floppy backup if your files are too large to fit on one disk.

A note of caution: you should remember to uninstall any copy-protected software following the software manufacturers' instructions. The backup procedure could render your copy protected software unusable if you don't uninstall it initially. This is a good reason to avoid copy-protected software.

Make two sets of backups, because the next action is reformatting the hard disk. Once your hard disk is reformatted, simply copy file-by-file back to the hard disk. During the restoration procedure, all your files will be copied back to your disk so that their clusters are sequential. If you use PC-DOS COPY you will put things back into sequential order. **Do not use the MIRROR IMAGE RESTORE feature on your tape back-up.** The hard disk should now respond much more quickly than before.

A more efficient way to optimize your disk is with commercial software made for this purpose. These programs will rearrange the clusters without requiring you to back up the system. These programs work by momentarily copying data from one zone of the hard disk to another. This frees up a contiguous zone of clusters to which data can be copied. We have found that these programs are safe even if the computer crashes or the power fails; as there is at least one facsimile of your data on the hard disk, you don't risk very much. We do recommend that you deinstall any copy protected software before using any commercial optimizing program, as it won't work with some copy protection schemes.

The best known of the optimizer programs is *SoftLogic Systems Disk Optimizer.* This program has four functions. The first function reallocates clusters to make files contiguous. The second examines your hard disk to see if it needs reorganizing. The third is a file locking system that can serve as elementary system security (not recommended). The fourth utility is a byte editor that is easier to use than PC-DOS's DEBUG.

There are a few other steps to making disk access speedier. The first is to copy back the most used files first to minimize the hard disk head movement. Also, make sure you have the proper entry in your CONFIG.SYS file for your BUFFERS = statement. Each buffer is 512 bytes long and the PC-DOS default is 2 for PCs and 3 for ATs. We endorse these general settings:

Files = 20
Buffers = 24

Because PC-DOS uses its disk buffers inefficiently, you can speed up input/output procedures for many of your programs by using a program that will momentarily store (cache) data read from the hard disk. These programs load the most frequently used sectors from the hard disk in system memory (RAM) to hold the access time down. You will find that the speed often goes up while the cache is active, because the cache program stores in RAM data most in demand.

The best known of these programs is probably the Portable Computer Support Group's *Lightning* disk caching program. It can buffer up to 1.5 megabytes, when it uses LIM 3.2 expanded memory. Also, with this program you can make the cache buffer as small as you want. The default cache size is 60K, and we have found it is typically hard to improve performance by varying the cache size. It is not unusual to locate data in the cache 50-to-60% of the time. *Lightning* can be put into memory and removed from memory at any time, and its memory can be used for buffering any disk drive or switched between drives after *Lightning* is running. The program can also distinguish when floppy diskettes have been swapped.

Your questions about these and other fine products can be directed to Diamond Software's sales department at (415) 633-2588. Diamond Technical is here to serve you with your technical considerations at (415) 633-2589. □

West's interest in hardware. Other sales types are made insignificant. This chart is on an inverted background.

Figure Three graphs only the data for vaporware. It shows that the central region has a particular fondness for not-yet-released products. To highlight this finding, I used a viewpoint that distorts in the same way that a fisheye lens does. It makes the "Central Region" figures seem to leap off the screen at the viewer.

Data for graphs is kept in *Perspective*'s data table, where it can be edited and excerpted. Data may be imported from *Lotus 1A* and *Lotus 2*, ASCII, SYLK and DIF file formats. Almost any program, database, spreadsheet or application can create at least one of these formats.

The data-manager is the only text-based section of *Perspective*. If you have a cranky Hercules-clone monochrome board, as I do, it is a good point from which to jump into RAM-resident text programs like *Sidekick* or *PC Outline*.

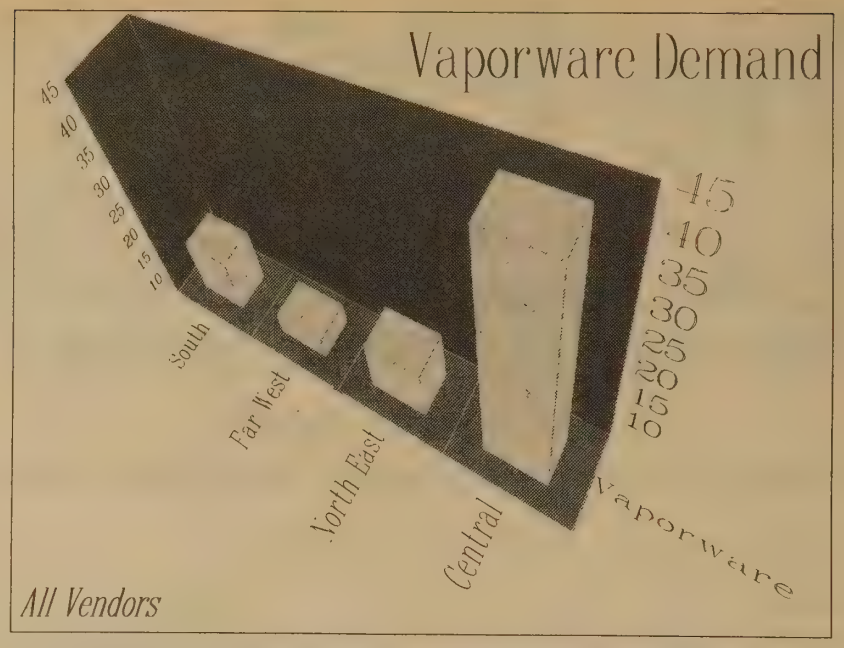
CHOICES, CHOICES, CHOICES

Perspective is a graphic "what-if" program. There are so many choices available to a user of *Perspective* that you can do what an artist can do: experiment over the range from hideous to beautiful. You have, for instance, over 175 patterns with which to paint the graph or the "cube" in which it is shown. You can make speckled graphs and spotted graphs, camouflage graphs, striped graphs. You can paint the cube, or make it invisible. The cube can have grid lines on it—horizontal, vertical or both. Not shown here are some terrible graphs I made during the hour I spent building the graphs you do see.

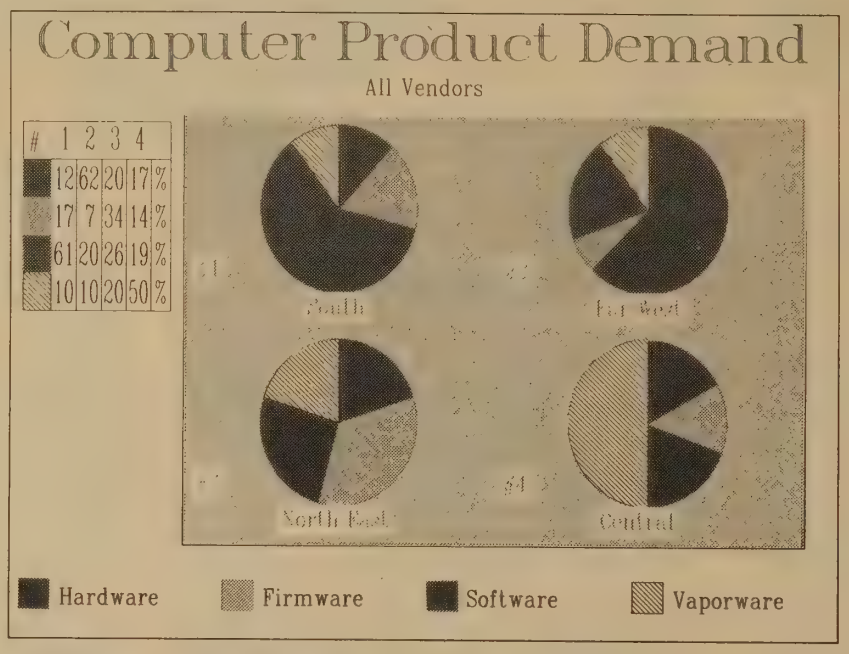
What's the use of having "too many choices", you ask? It lets you explore ways to show your data, to find out what works and what doesn't.

One set of sub-menus controls point of view. It lets you move the graph in three dimensions. On the screen *Perspective* presents three axes that represent the three axes of the cube. With the cursor-control keys, you can move the box left and right, up and down, toward you and away. You can rotate it along any axis. You can create the "fish-eye distortion" which is available in some of the pre-made viewpoints, to emphasize one part of the graph. You can even turn the graph on its side or upside down.

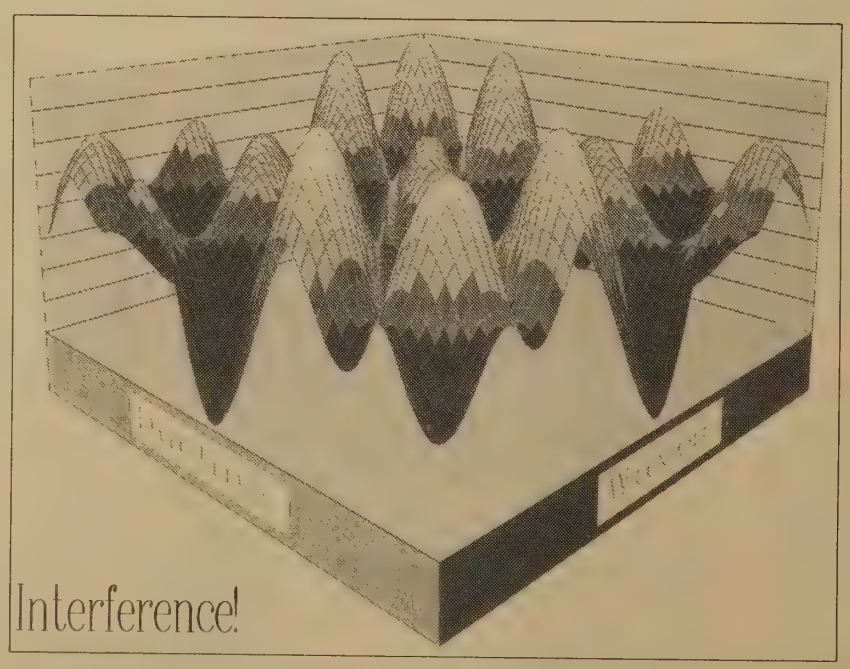
If you prefer to present your information in one of the traditional two-dimensional charts, *Perspective* provides 15 different types. There are all the classics: pie chart, bar charts, stacked bars, x-y charts. There are also specialized graphs. One chart uses different patterns to indicate different densities on an x-y chart. The result looks like a bacterial culture on a petri dish, and is excellent for presenting population densities. Another has two parallel axes. Points for the same row of data are connected from one axis to the other. You can use this graph to show before and after data, recording winners and losers in some change.



3. VAPORWARE. Vaporware demand in each of the four regions. These are the people who are waiting to get your product when it finally comes out—the fans of OS/2, aka ADOS, nee DOS 5.0, for instance.



4. REGIONAL PERCENTAGES. It shows, for each region, how the regional dollars are divided up. Each region has its own pie, and each of those shows the percentage of the computer dollar that goes into hardware, firmware, software and vaporware.



5. SCIENTIFIC. A graph of interference patterns. Data for this 60 x 64 mapping of interfering waves were generated and saved in ASCII format by a Turbo Pascal program.

Perspective makes the finest graphs I've seen in any program for any machine below the "dedicated workstation" range. For the business user, this is its selling point. It also shows how future programs can use the IBM keyboard for a graphic/menu interface that will rival the Macintosh interface without copying it.

Perspective can make multiple pie charts on the same plane. I used it in Figure Four to provide a different view of our mythical computer-dollar expenditures. You can see that each pie shows percentages for a different row—percentages which *Perspective* calculates for you and displays on one side of the chart. All the patterns available to paint parts of the three-dimensional chart are also available to paint regions of the two-dimensional charts.

Many business programs provide at least minimal graphics, but scientists often don't get similar capabilities from the applications they use. *Perspective* makes superb scientific data displays from data tables produced by observation or by mathematical programs. The data table for Figure Five was produced by a *Turbo Pascal* program that simulated the interference patterns of two sine waves. It is possible to show the results in any of *Perspective*'s formats, but the classic is the continuous surface used in Figure Five. Many of the two-dimensional graphs are particularly appropriate for scientific use as well. The prepackaged graphic system in *Perspective* frees the scientist from having to develop bit-mapped graphics anew for each application.

In fact, *Perspective*'s many custom options will even let you make a logo

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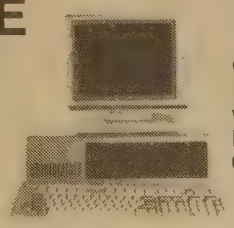

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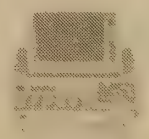

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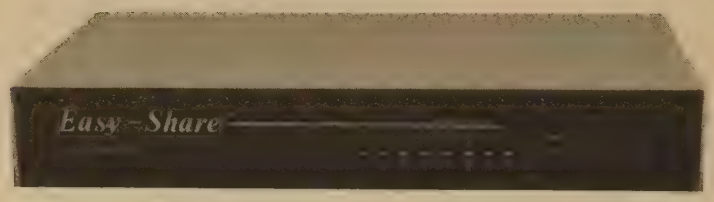

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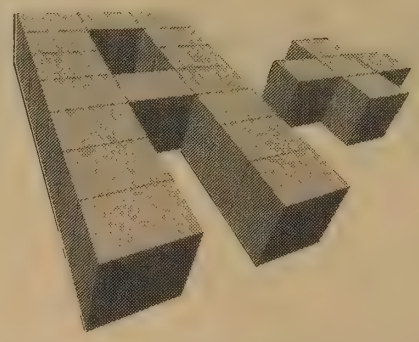

6. DESIGN & SYMBOLS. You can use Perspective to make 3-D graphics that don't seem to be graphs. This symbol has a data table in which the blocks in the "A" and the "+" are 1's, while the other spaces are blank. The cube's rear walls and floor were erased. Result—a floating letter.

out of a graph. In Figure Six you see an "A+" logo. The table behind this logo was a pattern of 1's and 0's that make up the "A" and the "+". From *Perspective*'s 32 three-dimensional graphs, I chose one that made its graph out of floating boxes. To make the boxes touch, I adjusted the ratio of box-size to the grid square to 1:1. Another menu allowed me to eliminate the cube by setting its color to that of the background. Finally, I shaded the visible faces of the boxes with another menu. The result was a three-dimensional logo made in ten minutes. The data for it use only a 7×6 cell area in the 64×64 cell data table. You can fit 192 characters of this size into the data table, far more than you can read comfortably.

Perspective has two printing options. You can print a screen dump, which produces results identical to what you see on the screen. One screen pixel produces one dot on the printed chart. The screen dump is the only choice for two-dimensional graphs.

For three-dimensional charts you can use the "superprint" facility. It recalculates the picture for you in the finest resolution available on your printer. You can get the 300-dots-per-inch resolution of a laser printer even though the resolution you see on the screen is much less.

CONCLUSIONS

My only complaints about this exceptional program are the amount of memory it takes (512K), and the fact that it is currently available only in monochrome. The large memory requirement leaves room only for medium-sized co-resident programs. The monochrome screen does not bother me, reviewing this program on a monochrome AT, but it would distress those who have invested in an EGA card and monitor.

Perspective serves its user in two ways. It makes the finest graphs I've seen in any program for any machine below the "dedicated workstation" range. For the business user, this is its selling point.

It also shows how future programs can use the IBM keyboard for a graphic/menu interface that will rival the Macintosh interface without copying it.

Three D Graphics has prepared a color version of the program, but so far it is available only in a version sold by Boeing as *Boeing Graph*. Another version is bundled with *Enable* (an integrated program from The Software Group), and being featured in a national advertising campaign. In choosing to bundle *Perspective* with their products, these publishers are acknowledging that *Perspective* has changed the rules in the graphics game. There is nothing on the market like it. □

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Resources:

Three D Graphics $295
860 Via de la Paz
Pacific Palisades CA 90272
(213) 459-8525

Requires:
- IBM Compatible Computing Machine
- 512K RAM
- Hercules or EGA Graphics adapter

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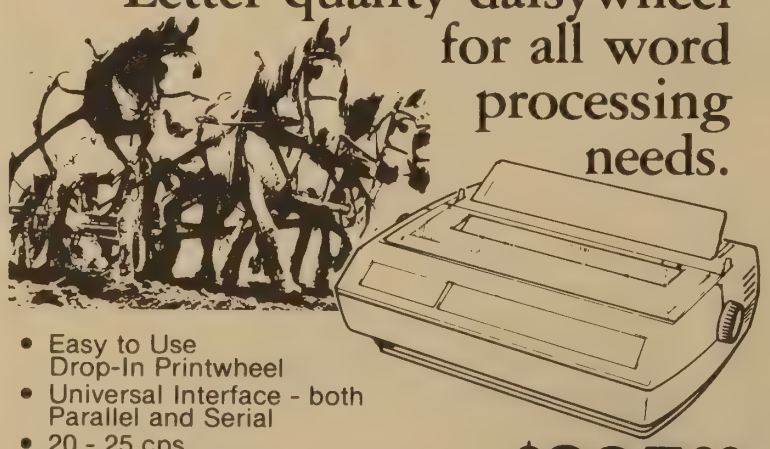

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R:BASE Graphics

By Don Whitecar

R:BASE Graphics from Microrim is a surprisingly easy-to-use package which allows you to produce graphs of your data in minutes. In a few more keystrokes you can then customize the graphs' color, text and style, then send them to your printer or plotter. It's a fairly large package, consisting of six diskettes, an Installation and Startup Guide, and a User's Manual.

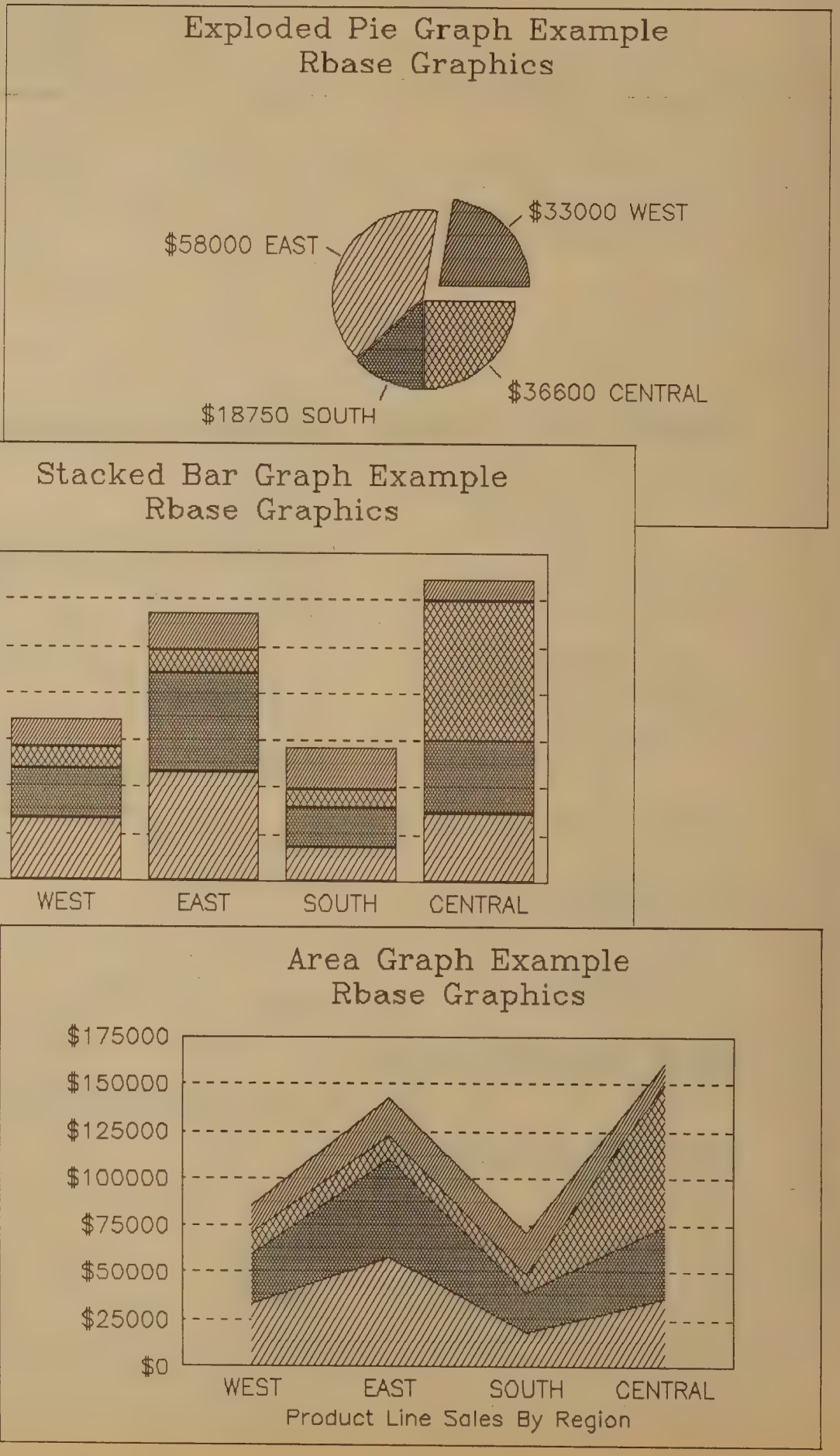
INSTALLATION

Almost a manual by itself, the Installation and Startup Guide contains an important array of facts—reading it is truly necessary. By the time you've installed the program, you'll probably have learned some important facts about your PC and DOS.

R:BASE Graphics supports DOS 2.0 or higher in its single user configuration, but requires version 3.1+ for multi-user systems. In any event, DOS 3.0 or higher is your best bet—3.0 supports the SHELL command, which is recommended to expand your system's environment. With DOS 2.0 and 2.1, public domain software may be required to adjust your system's environment size.

Two versions are available, one for *R:BASE 4000* and *R:BASE 5000*, and the other for *R:BASE System V*. There are three 5¼" system disks for *System V*, three for *4000/5000*, and three for device drivers. If you're already using *System V*, you'll now have 17 diskettes in your *R:BASE* collection. However, many of the files with *System V* and *Graphics* are not needed for production purposes and do not need to be installed. During the installation of *R:BASE Graphics*, only the files needed to support your particular drivers and monitor are copied to the hard disk.

Installing *R:BASE Graphics* involves more steps than most such procedures. I had to specify my monitor type, the various hard copy output devices for plots and prints, and the desired plot orientation. I also had to include several DOS SET and SHELL commands in my CONFIG.SYS and AUTOEXEC.BAT files. This was a little daunting, but all



R:BASE Graphics allows you to choose among a wide variety of displays for your data.

Copyright ©1987 by Don Whitecar. *Don Whitecar works with ICAD Systems, a microcomputer application consulting company specializing in R:BASE applications. He has accumulated over 5000 hours of R:BASE experience and is available for custom application development. He can be reached at (415) 572-8714.*

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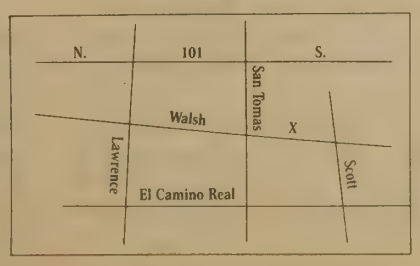

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went well and I was up and running within a few minutes.

R:BASE Graphics requires 512K system memory for single user workstations, a color monitor, and a hard disk. An IBM CGA or EGA, a Hercules graphics card or a 100% compatible card is also required. Unless you're doing screen slide shows exclusively, you'll also need a graphics compatible printer or plotter.

The installation guide states that two or more *R:BASE Graphics* users can simultaneously share one database in multi-user mode. However, one *Graphics* user cannot share a database with one or more *R:BASE System V* or *5000* users. *Graphics* must have exclusive use of the database in multi-user mode, which doesn't seem quite practical.

Depending on your needs, you may find some aspects of the program limiting. Within *R:BASE System V, Graphics* supports text, integer, real, date, time, and currency data types, with some provisions and exceptions. Currency is always displayed and interpreted as US currency (without the dollar sign). Date formats are always displayed in the MM/DD/YY format, no matter what format you've set in the database.

Double data types are treated as real numbers with six-digit accuracy. Note data types are treated as text. Text data types are accepted; however, only the first eight characters are used for display. Time formats display in the HH:MM:SS format, no matter what the time format is set to in the database. *Graphics* cannot use a *System V* view; only tables can be accessed for for graphic presentation. Finally, computed columns are accepted with the current calculated data.

The user manual for *R:BASE Graphics* is sufficiently clear and comprehensive. Less experienced graphics users may need some time to adjust to the terms and concepts, a process best done with hands-on experience.

PERFORMANCE

I evaluated *Graphics* using *System V* databases as the source of graph data.

The opening menu appears as:

R:BASE Graphics
Copyright 1987 by Microrim, Inc.,
Version I

R:BASE Graphics Main Menu

(1) Create a new graph
(2) Modify a graph
(3) Graph utilities
(4) Output Utilities
(5) DOS functions
(6) Exit from R:BASE Graphics

At first the variety of options and features is both overwhelming and impressive. My own anxieties about possible missing features dissipated as I discovered that many of the *R:BASE System V* features also worked in *Graphics*. The F3 key allows viewing of the database tables; the F10 key serves as the help key. If you're a *System V* user, you'll probably find *Graphics* very intuitive.

Graphs can be created from several types of data. Obviously, *R:BASE* databases are one possible data source, but *Graphics* also supports databases made from *FileGateway* or direct data entry into a graph's data set table. The package's data set editor can be used to modify data extracted from a database or for direct entry of new data values into a graph. The data set editor allows access to all the data and parameters used to generate the graph. Two screens of values can be accessed to change the graph data selection parameters, and five screens of values can be presented to change the format parameters of the graph. Once a graph has been extracted, the user has the option of re-extracting the data from the database or continuing to use the previously extracted data.

When using the "create a new graph" option, you'll need to give the graph a name and determine whether its data will come from a database or a datafile. The selected file name can be given with any drive or path information. If you're using a database, the database is opened and you're presented with tables to select from; you'll also see a screen and menu for building the graph's structure. Then select the x-axis column and the y-axis column—axis data can be columns, variables, or groupings. Variables also support the SuperMath functions of *R:BASE System V.*

Groupings are a new *R:BASE* concept that's missing from standard *System V* reports. A grouping is best explained by this example: suppose you want to obtain a report of expenses over the period of a year, broken down by month. The grouping would be defined as SUM OF EXPENSES BY GROUP, with the posting month column as the horizontal column in the graph. This would result in a graph of 12 monthly groupings, indicating the expenses for each month.

After establishing the x- and y-axes for the graph, its data can be sorted and screened using SORT and WHERE clauses identical in syntax to those of *R:BASE System V.*

The x-axis should consist of no more than 20 groups or elements; otherwise, the horizontal length of the graph may be illegibly crowded. The x-axis can be constructed from a combination of columns, variables, and groupings, while the y-axis is limited to one column or one variable.

The display of a graph from the data set table takes only a few seconds. The length of time required to extract the data set values from a database is a little longer. Simple requests from small databases take from ten to 30 seconds, equivalent to printing a database report. It took about 1 1/2 minutes to sum 350 records while subtotaling 14 groups from a table of 2500 records.

I was impressed by the simplicity of the menus, which produce a wide assortment of graphs. However, when I attempted to produce graphs with complex extraction requirements, I found some limitations. *Graphics* can sum, average, and take the minimum/maximum values of a table column. However, it could not tally the incident quantity of an item, nor could it graph the sum of a column grouped by another column. For example, I wanted to separate the monthly category expenses of electricity, water, gas, sewer, janitorial, and landscaping invoice payments using a column graph of monthly amounts over a 12-month period for a particular building. All I could achieve was a total summation of all expense types, or I could use the WHERE clause to screen one category at a time. I wanted a stacked 12-column graph where each block of a stack represented the monthly total for each category.

I also wanted to produce a similar graph for each building in my database, some 200 in all. How would I produce 200 graphs? Was I to sit at the terminal, change the building number, compute the graph, plot, then proceed to the next? Were 200 graph files required? *R:BASE System V* includes keystroke macros; however, this feature is not provided with *R:BASE Graphics,* nor is the ability to redefine keys. The need for a batch programming language and key macros is apparent; perhaps it will be provided in the next release.

The appearance of the graph can be instantly changed to one of eight different types: area, line, column (stacked or unstacked), mixed (bar/column and line), bar, pie chart, scatter and high/low graphs.

The appearance of the graph can be instantly changed to one of eight different types. Area, line, column (stacked or unstacked), and mixed (bar/column and line) are good formats for displaying data over time. While bar graphs are good for displaying comparisons, pie graphs are best to display a percentage of a whole. Scatter graphs are useful for plotting the frequency and range of data points. And finally, high/low graphs help display the range of highest and lowest values during a period. It only takes a few seconds to redisplay data in a new graph type, so it's easy to determine which graph type is best suited to conveying the information.

Once a graph type has been set, there are many features available to enhance and illustrate the graph. There are features to edit/delete/relocate/size legends, free-standing text, titles, x-name, y-name, and labels. You can choose from one default fault and six custom fonts—sans serif, Roman, italic, bold sans serif, bold Roman, and bold italic.

You can add or remove a frame around the graph data or around the entire graph. Horizontal grids and vertical grids can be added. Graphic patterns can be changed to one of eight options. The graph's baseline is initially set to 0; however, this too can be changed. The legend block can also be edited, removed and relocated.

R:BASE Graphics supports a wide variety of display color options and lets you plot output in various colors. Menu-driven screen color settings are available to change text and graph colors.

To print a graph, press F3 for the menu option or choose the "output utilities" menu option. Output can be a half or full page on a printer or plotter—a pen-color menu is also included. *R:BASE Graphics* supports Anadex printers, Diablo C-150, Epson Series 100 printers, Epson Series 80 printers, HP LaserJet+, HP 7440A, 7470A, 7475A, 7580B, and 7586B plotters, HP ThinkJet printers, IBM Graphics printers, NEC Models 3550 and 7730 LQ printers, Okidata Microline 84 and 92 printers, Tektronix 4695/4696 printers, TI 850 and 855 printers, and the Toshiba C351 printer. The user can specify the number of copies needed, and whether a pause should be made between plots and prints.

R:BASE Graphics also has two unexpected extras. Using the split-screen utilities, you can define up to 32 windows on the display and assign a graph to each window. Split-screen images can be saved, recalled, plotted and printed. This feature is superb when you want to make an impact on your audience with one piece of paper.

R:BASE Graphics lacks several features I'd expected to find. It is, for instance, impossible to escape the operation during data extraction. I would frequently start the computing of a graph, then realize my criteria were invalid. However, I couldn't do anything but wait for *R:BASE Graphics* to inform me of my error.

Further, the program does not let you place arrows and leaders from text to graphic elements, and I was unable to slant, rotate, or underline text.

On the whole, though, *R:BASE Graphics* is a useful addition to your R:BASE database applications. The creation of graphs is simple and straightforward. With this program, users can now present their information in a high-impact format—text reports have their place, but a graph offers a more effective and widely-accepted presentation.

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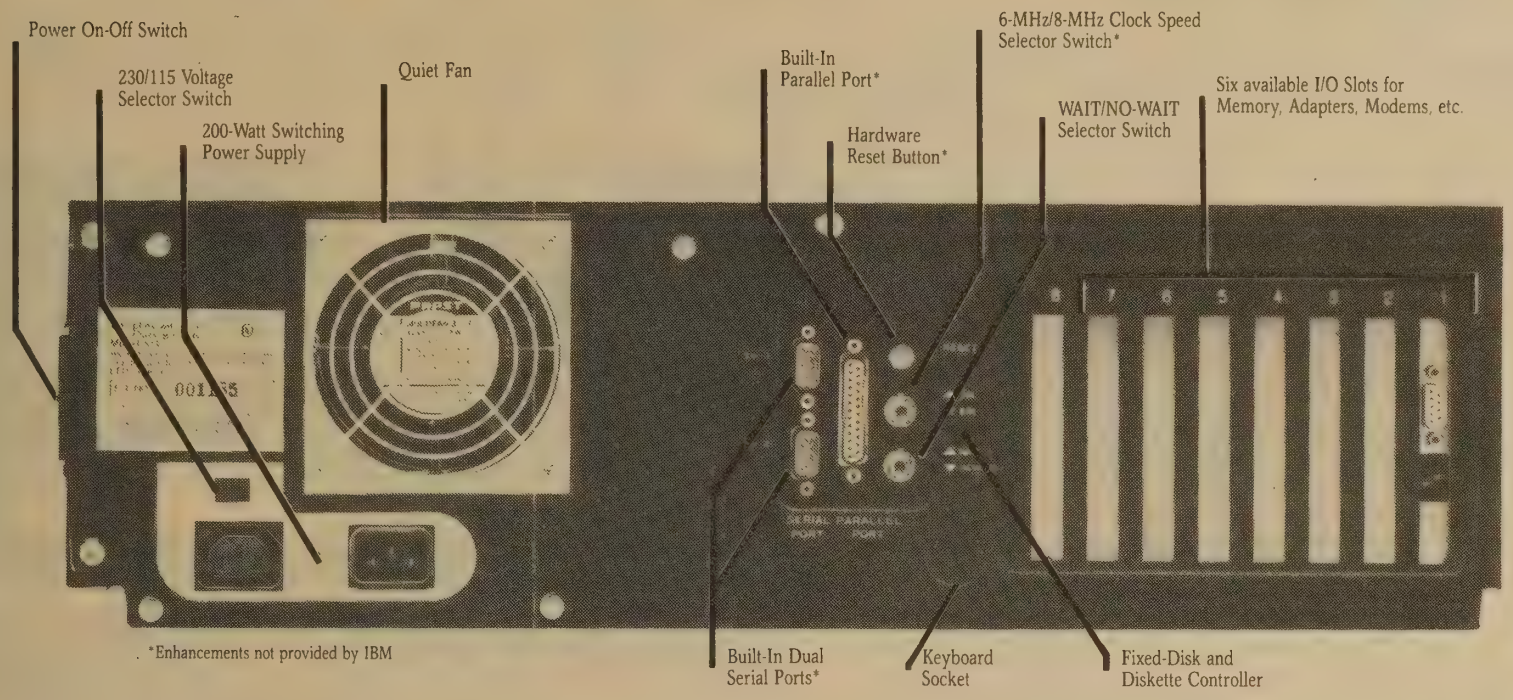

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TRUMPCARDS:

UPIC Puts An 80MB Hard Disk On A Plug-in Card

By Aubrey Pilgrim

In mid 1985 Quantum Corporation announced that they had managed to install a 3½ inch 10 MB hard disk on a standard plug-in card for the IBM PC, XT and compatibles. That was a fantastic idea. There were no cables to worry about and it was very easy to install. It could be removed from one computer and plugged into another, across the room or across the country. If you had sensitive data on it, you could remove it and lock it up. It could be used to back up other hard disks and it had many other excellent features.

Soon after Quantum introduced its 10 MB Hard Plus card, a dozen other companies came out with similar hard disks on a card. Some of them even managed to put 20 MB on the hard card. And then later 30 MB became common. Almost everyone was selling their hard cards for less than Quantum.

For some time 30 MB seemed to be the absolute limit for the hard cards. But in November of 1986, Universal Peripherals International Corporation (UPIC), demonstrated hard cards with capacities of 30 MB, 45 MB and 60 MB at the Fall COMDEX. They called them Trumpcards. They have recently demonstrated an 80 MB Trumpcard.

All of the models are the same size and fit on a standard full length plug-in card. The drive portion is mounted on the front half of the card and is 1.7 inches thick. This means that the drive portion of the board extends over the front half of the space of the adjoining slot. With today's surface mount technology, however, Very Large Scale Integration (VLSI), and Application Specific Integrated Circuits (ASIC), many standard boards have been reduced to short half boards. A half board will easily fit into the slot next to a Trumpcard so that you may still have use of all your slots. (See Fig. 1).

The Trumpcards can be used in the IBM PCs, XTs, ATs or compatibles. They can also be used in the 80386. The card can only be installed, however, in one of the two eight bit slots of the AT or 80386.

As you probably know, the AT has two eight bit slots and six 16 bit slots. The 16 bit slots have the standard 62 pin connectors with the standard bus. They also have 36 pin connectors mounted in front of them for the extra data lines. The 80386 has two eight bit slots with the standard bus with 62 pin connectors, two or more 16 bit slots with added 36 pin connectors and two or more slots with a second 62 pin connector for the 32 bit data lines.

The frame of the Trumpcard extends to the same width as the edge connector on the plug-in portion of the card. (See Fig. 2). Because of this the Trumpcard can only be plugged into an eight bit slot. The high capacity hard disks on a card can be used in Local Area Networks (LANs) as a file server.

UPIC is able to cram as much as 80 MB onto a 3½" disk on a card by using data compression and variable cluster sizes. For those who are not too familiar with how a hard disk is formatted, here is a brief review.

The standard hard disk format creates concentric tracks on the surfaces of the disks. Depending on the capacity of the drive, it may have four or more platters. Each side of these platters may have 600 or more tracks. Each track is divided into 17 or 18 sectors; each sector will hold 512 bytes. Since 512 bytes is a rather small amount, the tracks are further divided into clusters. There is no standard size for clusters and they vary among the different manufacturers. Some clusters may be as small as 2K, or up to 4K, 8K and even 16K. Since there are 512 bytes to a sector, it would require 32 sectors for each 16K cluster on a hard disk.

A cluster cannot have data from two different files written into it. If your disk is formatted to 8K clusters and you have several small files, perhaps with only 2K of data, each file would occupy a full 8K byte cluster. In this case there would be 6K of unused space in each cluster. If you had a file that had 8001 bytes in it, it would require two 8K clusters.

When data is written onto a disk, the File Allocation Table (FAT) keeps track of where each file is stored. A file will be stored in the first empty cluster that is available. If it is a long file, portions of it may be recorded in several clusters, which may be anywhere on either side of the disk. If the data on the disk is frequently edited, changed, deleted, or erased, there could be several empty clusters and the data could be spread out all over the disk. This is called fragmentation. This can severely slow the access time because it takes time for the heads to move to another track; then they must stop, settle and stabilize before they can read the data.

One way to alleviate the problem of fragmentation is to periodically copy all of the files onto a backup tape or floppy disks, erase all the files from the hard disk, then restore the files from the backup. There are some software programs such as the Mace utilities that will unfragment and re-organize the data on a hard disk without having to go through the steps listed above.

The built-in electronics on the Trumpcard that automatically re-or-

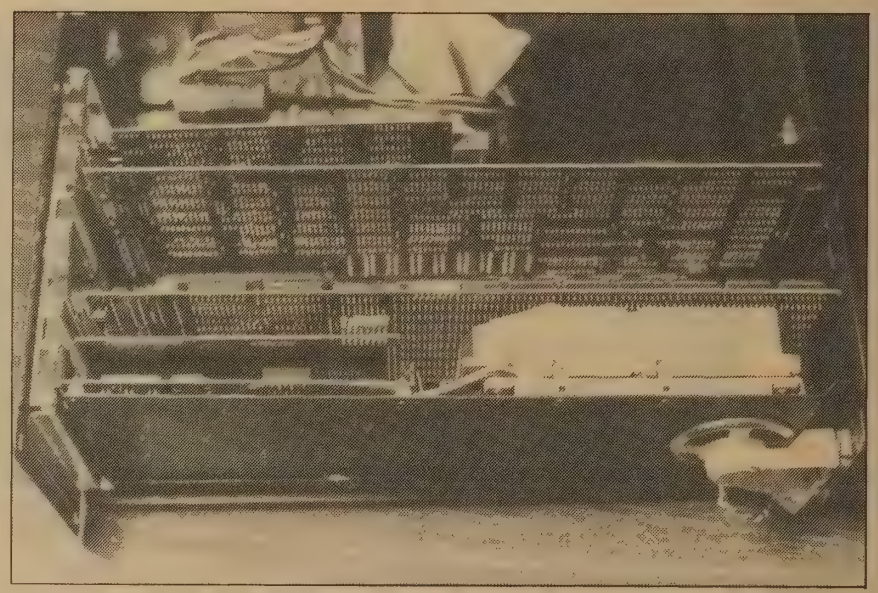

FIGURE 1 — The 80 MB hard disk mounted in slot #1, a short card in slot #2 and a standard long card in slot #3.

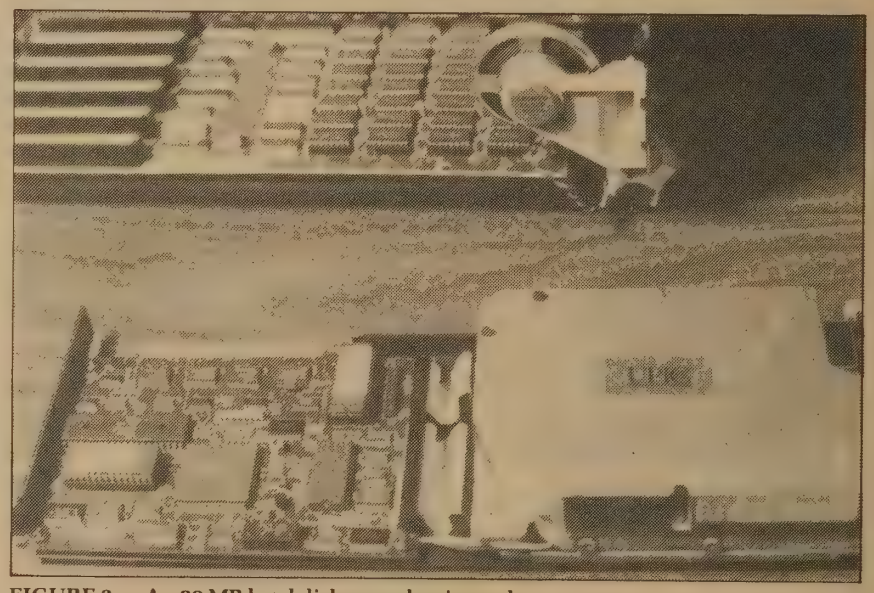

FIGURE 2 — An 80 MB hard disk on a plug-in card.

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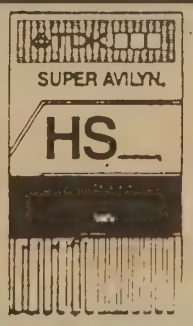

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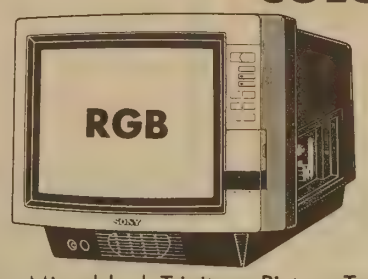

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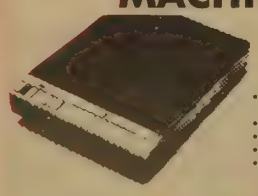

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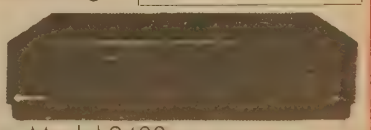

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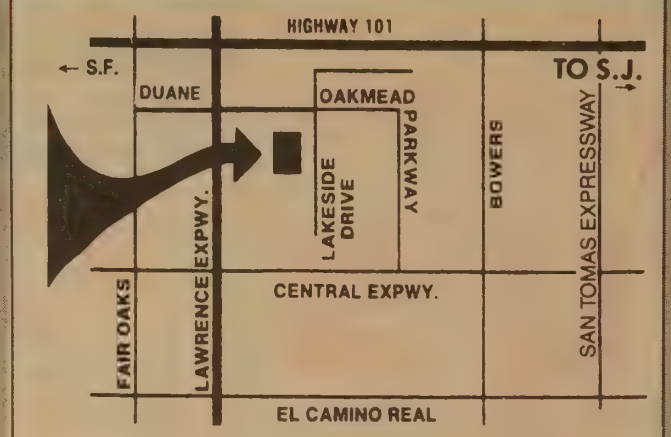

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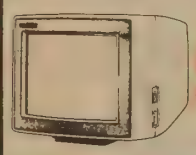

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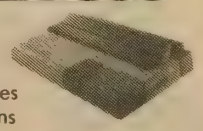

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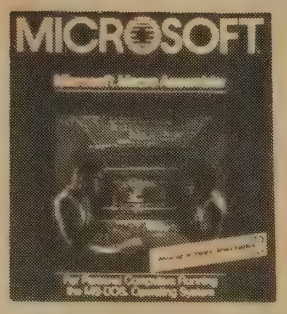

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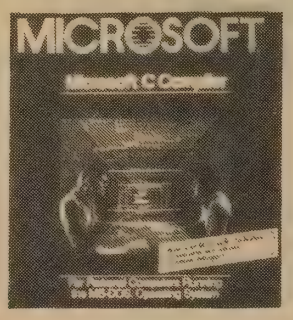

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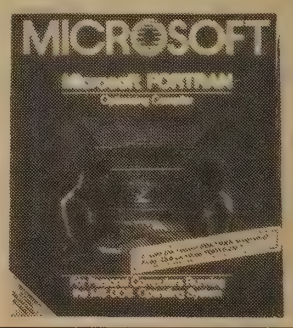

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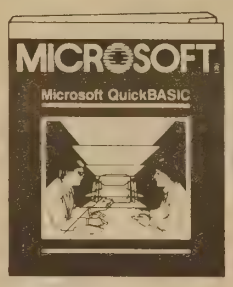

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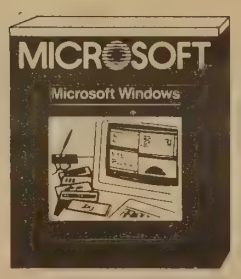

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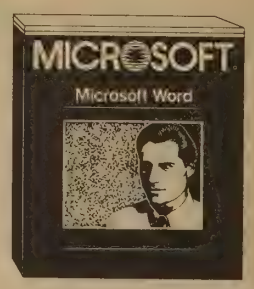

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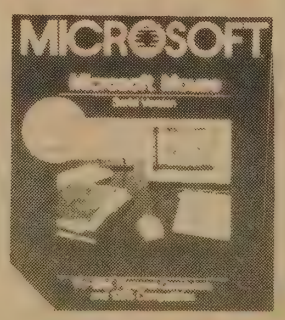

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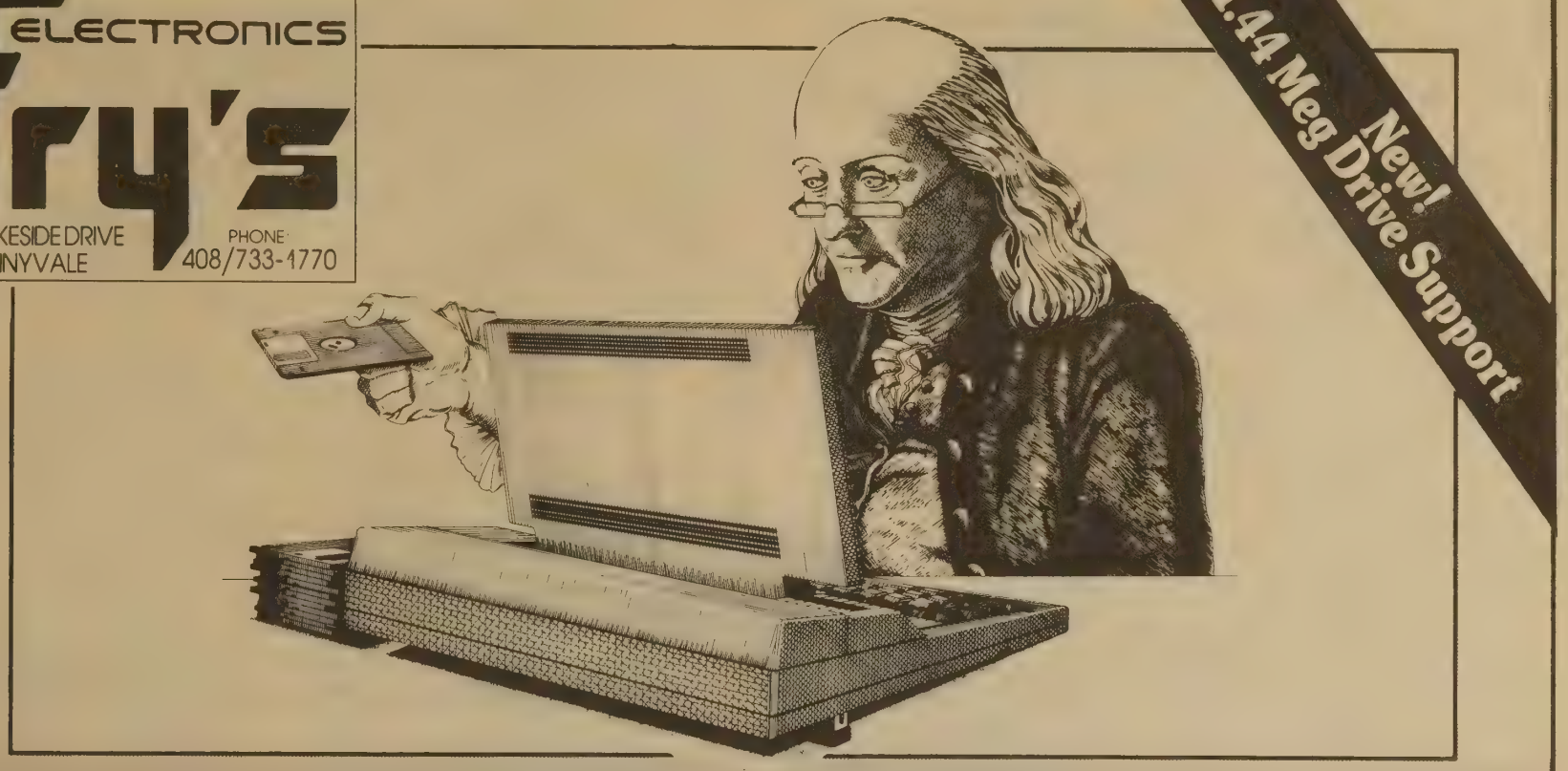

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	Cluster 1	Cluster 2	Cluster 3
Track 1 File 1			
Track 2 File 2			
Track 3 File 3			

FIGURE 3 — A representation of clusters, tracks and data showing how a disk may become fragmented.

	Cluster 1	Cluster 2	Cluster 3
Track 1 File 1			
Track 2 File 2			
Track 3 File 3			

FIGURE 4 — A representation of data that is contiguous, compressed and compacted.

ganize takes some time to accomplish this. The system waits until it has free time to do it. Since all of the data in each file is in contiguous clusters, it can be accessed very quickly. The Trumpcard also uses a cache system that speeds up both the read and write access time. The larger the cache, the faster the access time. You can determine the size. The cache uses your RAM memory, however, that means if you make the cache too large, you may have problems running some of your memory-hungry programs.

The Trumpcard system also uses an Error Correction Coding system that is based on the amount and degree of compression and compaction of each cluster. It is very accurate and can detect and correct errors to a much greater extent than the standard Modified Frequency Modulation (MFM) system. If the Trumpcard finds hard errors on the disk, it will map them out and prevent their use.

The Trumpcard system uses variable length clusters that fit the length of the file. Therefore there is never any empty space in its clusters. It also uses a form of compression and compaction on the files to further reduce the amount of space required. The compression is similar to that used by bulletin boards for archiving. The built-in electronics on the Trumpcard controller compresses and decompresses the data as it is written on the disk or read back off it. The amount of compression varies with the type of data. Graphics and some repetitive string type files can be compressed by as much as eight to one. This means that an 80K file would fit in 10K of disk space. But many files can only be compressed by 20-30%.

Using the UPIC methods, disk capacity is usually increased by over 50%. A standard 20 MB hard disk will store about 36 MB and a 40 MB will store over 60 MB.

It is possible therefore, to have 80 MB on a hard card. There is, however, a problem. DOS 3.2 can only handle a maximum of 32 MB. Several software packages have been developed that will allow you to install much larger disks, but the Trumpcard has this capability also built-in. UPIL suggests that you partition the disk into a small C: drive and have the rest of it be the D: drive.

A floppy disk and installation manual comes with each Trumpcard. The manual has some very good basic information in it, but it is not needed to install the drive. All that is needed is to put the floppy disk in the A: drive and type INSTALLAT. A menu will come up and walk you through the simple formatting process.

The controller on the Trumpcard is based on the Konan type controllers. This controller is similar to the standard hard disk controllers in that it can control two hard disks. It has connectors for cables to control an internally or externally mounted hard disk as well as the hard disk on the card. This second hard disk would use the same type of variable length clusters and data compression to yield at least 50% greater storage.

Steve Cooper, a design engineer for UPIC, says that he has set himself a goal to put over 100 MB on a Trumpcard. The present cards do not use the RLL technology. By using RLL and some of the newer technologies, he says that he is certain that he can build a hard disk on a card with well over 100 MB in the very near future.

That is almost incredible. But I believe him.

Paramount Electronics of Sunnyvale has also recently announced an 80 MB plug-in hard disk on a card that is similar to the Trumpcard. They call it the Data-Pak card.

UPIC is located at: 100 Homeland Court, Suite 330, San Jose, CA 95112. (408) 947-8742. Paramount is at: 1155 Tasman Dr., San Jose, CA 94089. (408) 734-2135. □

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BLUE-ICEer:

Automatic Diagnostic Instrument Freezes High Cost Of Computer Service And Repair

By Aubrey Pilgrim

Computers nowadays are very simple to assemble. They do, however, have some very complex circuits and components. To operate properly, the circuits depend on very precise timing, voltages and rather high frequencies. Most computers operate very well for long periods of time. But eventually nearly all of them will require some sort of service.

A computer can develop a great number of problems. Some of them are easy to diagnose and repair. Some problems can be very difficult. A good technician can spend hours of troubleshooting, using very sophisticated equipment and still not be able to find the problem and repair the computer.

For troubleshooting and diagnosis of computer problems, a technician usually needs a good high frequency oscilloscope, a logic analyzer and a good voltmeter. Of course the technician must also have a good working knowledge of electronics, computers and the function and purpose of each component and circuit in the computer.

Paramount Electronics of Sunnyvale has developed an automatic test instrument that can diagnose a sick computer in just minutes, eliminating the need for expensive testing by a qualified technician.

Bill Boutin, the President of Paramount Electronics, explains how this machine came to be developed: "We import large numbers of computer components. Many of the boards and components have a very high failure rate. My bench technicians spent hours testing and troubleshooting boards before we built up our systems. Even then we would miss some of the problems and have angry customers bringing their computers back to us for repair. We discussed the problems with some of our engineers and decided that there must be an easier way. So we set about designing an instrument that would automatically check the components and circuits on a mother board. It checks all of the components and also every circuit. It will automatically locate and identify any faults or failures. It will even check some plug-in boards for faults and for faulty disk drives. It has saved us hundreds of hours of troubleshooting."

This instrument is called the BLUE-ICEer. The ICEer part of the name stands for In Circuit Emulator. The BLUE part of the name is a bit of whimsy referring to "Big Blue." This instrument will check out genuine IBM PCs, XTs, compatibles and clones.

Most service and repair shops charge at least $50.00 an hour plus parts for computer service and repair. The cost of the parts is usually insignificant compared to the cost of the time it takes to troubleshoot and find a problem. It may take hours to locate a defective component or circuit. The BLUE-ICEer can find them in just minutes.

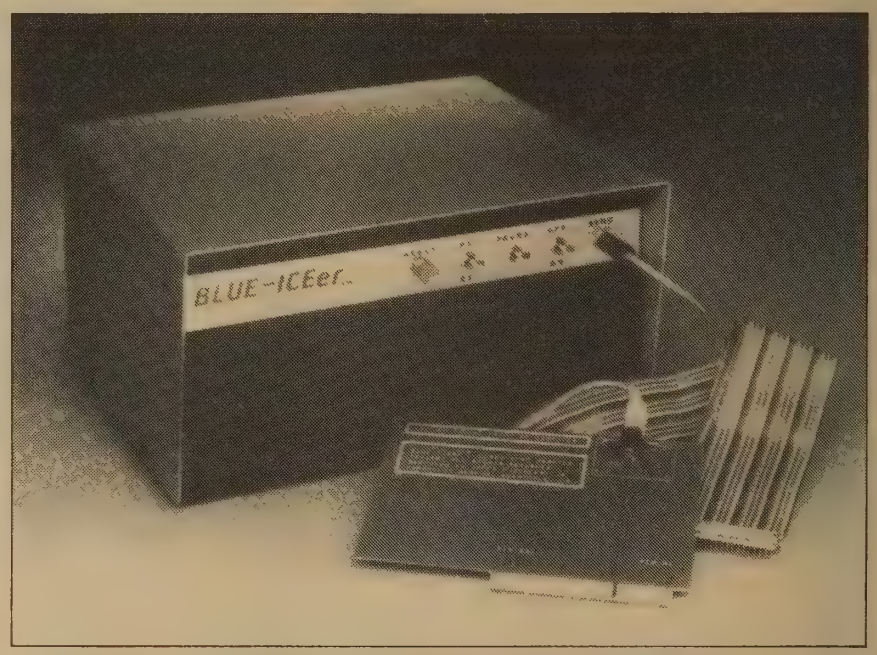
Since the tests are all performed automatically, it takes no special training or expertise to operate the instrument. In order to use it, the 8088 CPU is removed and a cable from the BLUE-ICEer is plugged into the socket.

Before plugging in the BLUE-ICEer, however, you must make sure that the power supply of the computer under test is good. If the fan does not run when the power is turned on, there is probably a direct short somewhere on the motherboard or the power supply is defective.

Most of the power supplies have a built-in protective circuit that shuts them down if too much current is drawn. The power supply puts out +5 volts, −5 volts, +12 volts and −12 volts. A short in any of these circuits could cause the power supply to shut down.

The power connector to most of the motherboards is in two parts. You can unplug one part of the connector, turn the power on and, if the fan now runs, you can be pretty sure that there is a short on the motherboard somewhere involving that particular voltage. If the fan doesn't run with both plugs disconnected, then it is probably a defective power supply. It is easy to check for the proper voltages with a simple voltmeter.

If these preliminary tests indicate that there is a short on the motherboard, then there should be further investigation. The technician should look for paper clips, staples, or any other object that might have fallen into one of the board connector slots of the motherboard. The back side of the board should also be checked for shorts. It might be necessary to disconnect some of the large by-pass capacitors on the voltage lines and check them for shorts.



The BLUE-ICEer is a useful diagnostic tool for PCs, XTs and clones.

If there are no shorts, the BLUE-ICEer is then plugged in and turned on. It will immediately begin testing the various circuits. A computer monitor attached to the instrument shows what tests are being performed and the results.

Since most of the chips in a computer circuit work in conjunction with one another, the failure of one may cause another one to appear to be defective. At the end of the test, however, results of all tests are shown on the screen, or they can be printed out. The chip that fails the most tests is usually the defective one. If this chip is replaced, then another quick test is run, it will usually pass all tests and the problem is fixed. On some occasions, two or three chips may have to be replaced before the problem is solved. Most chips on the motherboard are mounted in sockets so that they can be easily changed.

Every computer service and repair shop should have one of these machines. Computer dealers could also benefit from the use of this instrument. If the computer has been checked by the BLUE-ICEer, then the dealer can be pretty sure the customer will not be bringing it back for service.

It is very important for large corporations and companies to keep their computers up and running. Many companies have large maintenance departments, or hire service companies, just for their computer upkeep. These companies can benefit from the BLUE-ICEer because it can drastically reduce the amount of down time that the computer spends in the shop.

The instrument sells for about $3000.00. It pays for itself, however, many times over in the diagnostic time and labor it saves.

At the present time it is available only from Paramount Electronics. They are negotiating with several distributors and dealers for more widespread distribution and sales. Paramount Electronics is located at: 1155 Tasman Dr., Sunnyvale, CA 94089. Tel (408) 734-2135. □

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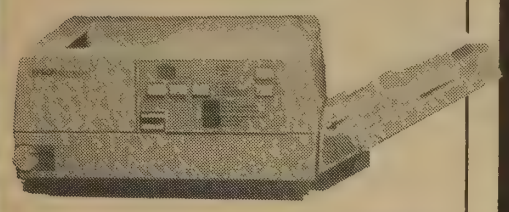

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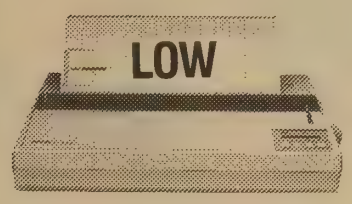

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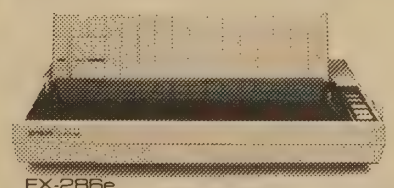

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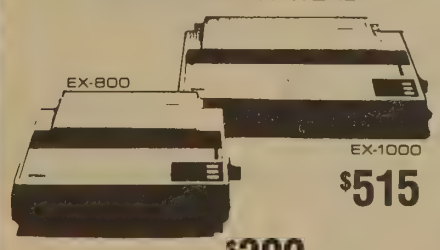

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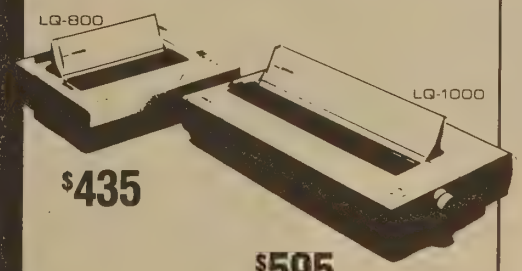

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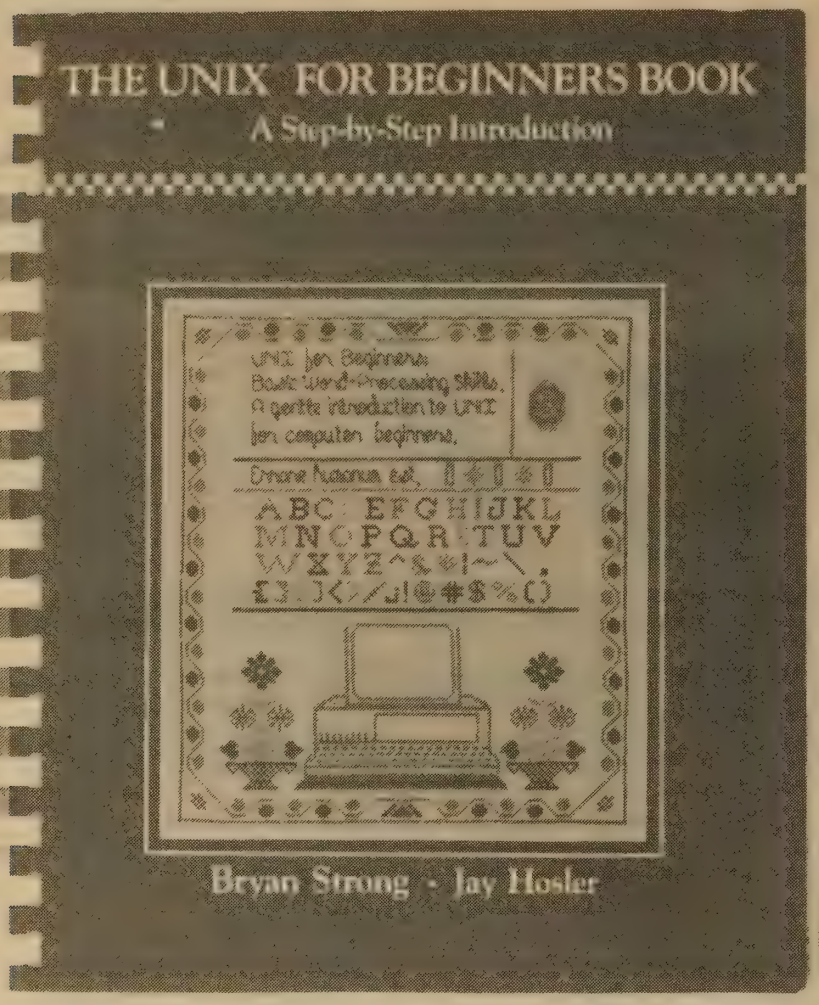
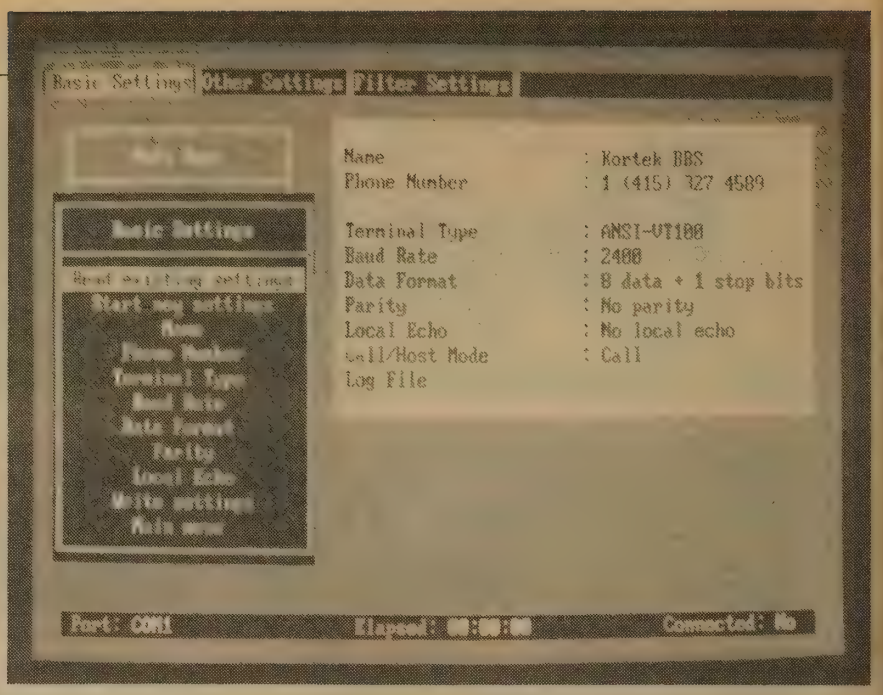


A Step-By-Step Introduction to UNIX For Beginners

A Step-By-Step Introduction To UNIX For Beginners

The UNIX For Beginners Book by Bryan Strong and Jay Hosler is not just a guide for beginners to the UNIX operating system but for beginners to the computer world as well. It teaches the basic UNIX user skills needed for tasks such as writing letters, papers, memos and organizing information using the UNIX file system. It is written in an informal non-technical style that explains and demonstrates each new concept and techique with a building block approach. Wiley-Interscience 605 Third Avenue., New York, NY 10158.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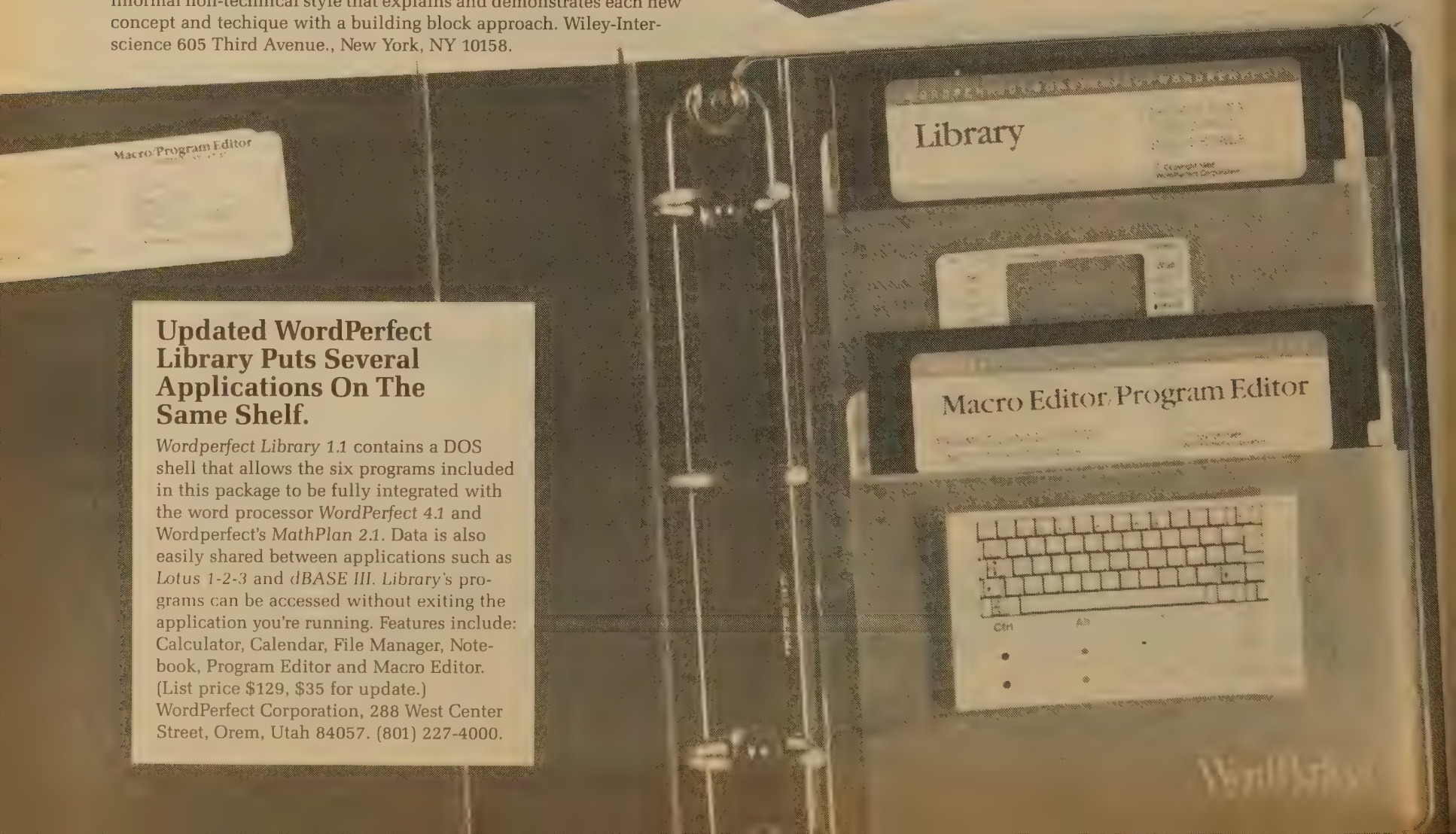

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Wordperfect Library 1.1 contains a DOS shell that allows the six programs included in this package to be fully integrated with the word processor *WordPerfect 4.1* and Wordperfect's *MathPlan 2.1*. Data is also easily shared between applications such as *Lotus 1-2-3* and *dBASE III*. *Library*'s programs can be accessed without exiting the application you're running. Features include: Calculator, Calendar, File Manager, Notebook, Program Editor and Macro Editor. (List price $129, $35 for update.) WordPerfect Corporation, 288 West Center Street, Orem, Utah 84057. (801) 227-4000.

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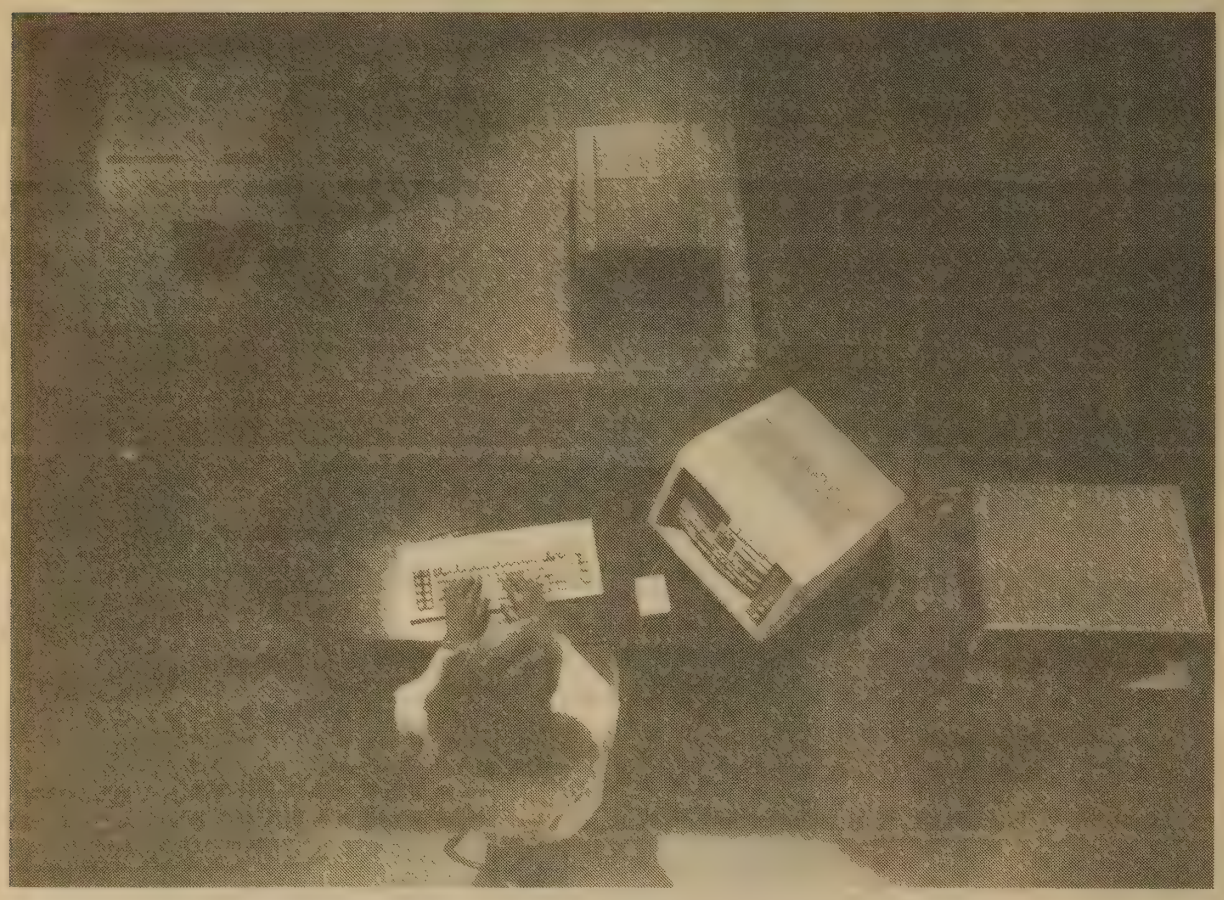

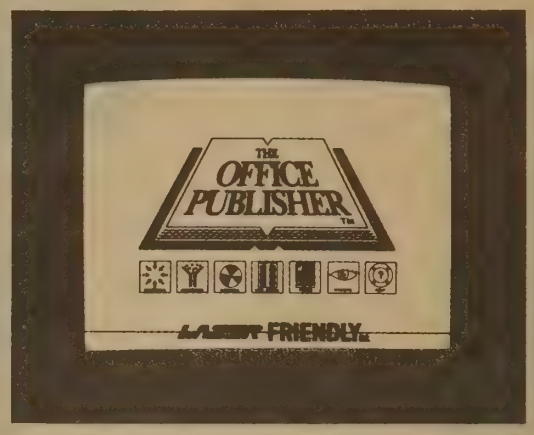

The Office Publisher For Your PC

The Office Publisher from Laser Friendly is desktop publishing software for your PC. It provides a document converter, WYSIWYG editor, text editor, graphics editor and a format library. Typographic features include kerning, tracking, leading, hyphenation, justification and vertical tabulation. It edits graphics and text and puts them on the page. It also accepts text from external applications such as word processors and spreadsheets. Laser Friendly Inc. 930 Benecia Ave., Sunnyvale, CA 94086. (800) 331-4803.

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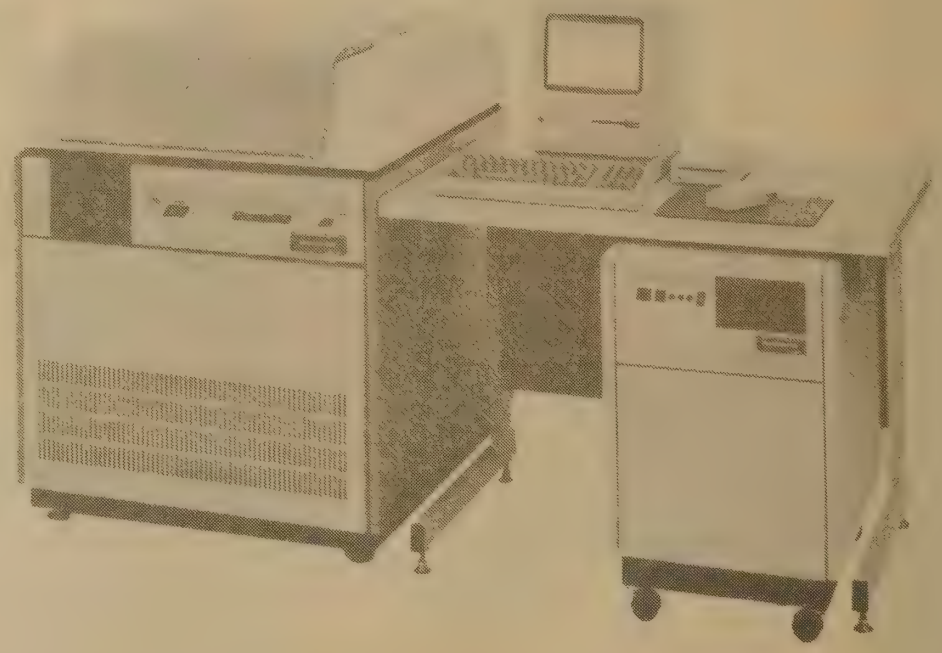

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And Then There Were None

By Brock N. Meeks

I submit that, in this age of high-tech, high-touch, a new "right" should be defined: the right to low-cost access to information.

There is not a moment to waste.

On June 10, 1987 the FCC issued a Notice of Proposed Rule Making (NPRM) that will, on January 1, 1988, push the cost of information access into the stratosphere and guarantee the creation of a new social class: the "information poor."

These information poor won't be able to dial into computer databases or commercial online services simply because they won't be able to afford them, not because they don't want them. We're close to that situation now, given the current cost of information access, but with the promise of a dramatic rate increase looming on the horizon, the future looks grim.

The FCC proposal calls for assessing an additional charge of about $5 an hour for computer telecommunications services that offer enhanced services, such as those provided by U.S. Sprint's Telenet and Tymnet. These enhanced service companies are currently exempt from access charges. The FCC proposes to eliminate this exemption.

If the exemption is eliminated, you can take the price you pay for every hour of connect time and jack it up by at least five bucks, and probably much more. (Five dollars would likely be the charge if these services just passed on the increase to their users; in reality, they will probably raise charges even more to cover administrative charges.)

"If this proposal were to go into effect, our country's blossoming information age could whither and die without ever fulfilling its heretofore bright promise," says Paolo Guidi, president of Telenet. Educational institutions will also be harmed, according to Guidi, because "they are just now beginning to have affordable information services made available to them."

A MATTER OF EQUITY

FCC attorney Ruth Milkman told the Commission at the June 10 meeting that the basic theory behind the removal of the current access charge exemption is that if enhanced service providers use local networks to provide interstate services, they should pay for the same access and contribute to cost of facilities in the same way as providers of voice services.

Copyright ©1987 by Brock N. Meeks. All rights reserved.
Brock Meeks is a San Diego-based freelance writer and modem minuteman.

Milkman adds that the commission realizes that imposing the fee on computer services would not offset the charges on long distance carriers. Rather, she says, the FCC merely wants all carriers to pay an equal share for use of the local telephone exchange.

The Commissioners were in agreement that the crux of the access charge issue is "a matter of equity," as stated by Commissioner Mimi Weyforth Dawson during the June 10 meeting.

"The bottom line here ... is that we want the networks to evolve ... in response to a consumer demand ... not to various subsidies and anomalies," said FCC Chairman Dennis Patrick during the agenda meeting. He added that the information service providers have had plenty of time to get used to the charge and would "bear a heavy burden" to prove they could not deal with it.

"We're currently paying about 30 cents an hour, effectively, for dial-in access," counters Philip Walker, a vice president for Telenet. "We buy an ordinary business line for about $30 a month. And we use it about 100 hours. Under [the proposed] access charges, that same dial-in hour of use would cost us about $4.50; that's a factor of 15 increase." What will Telenet do with that added charge? "Pass it on to the consumer; we can't absorb that kind of rate increase," says Walker.

TELECO MATH 101

Consumer advocate groups are backing the ruling because they believe it's time that "data users pulled their own weight," according to Sam Simon, president of Issues Dynamics, Inc., a telecommunications policy firm in Washington, D.C. "The proposed access charges are considered common carrier line charges for fixed costs; that is, the cost of the local phone companies to maintain their equipment."

"After all," says Simon, "voice users, for years, have been saying they are subsidizing new costs to handle data line traffic, costs for services they neither want nor use.

"When the BOCs [Bell Operating Companies—local telephone companies] start getting increased revenues from charges on enhanced services, that money will go for fixed costs. As this happens, overall charges will go down, and eventually, the access charges, as well."

Think again, Sam. Let's do some math, and it's rather simple math at that.

According to figures obtained from the FCC's traffic analysis branch, long-distance, interstate voice calls rack up 115 billion "conversation minutes" a year. Figures obtained from public records and conversations with officials at various enhanced services put interstate data use at 2.8 billion minutes of data usage a year. Mark Uretsky, a financial analyst with the FCC's traffic analysis branch, says that data usage "certainly isn't any bigger than 3% of the [long distance] voice figure."

A simple turn of the crank on your adding machine shows that our figures set data usage at 2.5% of voice use, a figure that's even less impressive when you consider that the revenue generated from this extra 2.5% is spread across all of the BOCs.

That 2.5% doesn't go very far to maintain those fixed costs. Further, the increased overhead to administer the extra revenue will cut deeply into the 2.5% figure, so the actual increased revenue to BOCs is a somewhat meager 1%.

That 1% is not substantial enough to cause the FCC to call for a lowering of access charges. (When the BOCs are treated to larger revenues, it's been the Commission's policy to then decrease interstate access rates. However, with only a 1% increase, the FCC is not likely to require a lowering of access rates). Without a lowering of access rates, the BOCs are handed a windfall profit. Merry Christmas.

The BOCs gain; everyone else losses. Long distance voice users don't get lower rates, and data users are handcuffed into paying an astronomical rate increase. And for the privilege of paying higher rates, data users don't get *any* increase in quality, quantity, or performance! But to the advocates of this proposal, these facts are secondary.

Simon, although agreeing that data users will feel a crunch in their wallets, says: "This applied access charge is the only 'fair' thing to do. It makes everyone pay their own way. Equity, not the bottom line, is the real issue here."

What Simon and other advocates don't realize is that the ruling will actually create an environment of *inequity* and discrimination.

BITSTREAM DISCRIMINATION

One of the potential loopholes in the proposed ruling is the creation of private networks as a bypass. Because there are comparative characteristics of such private networks that perform similar tasks as enhanced service providers, such private networks are likely to be the center of debate during the comment phase of ruling. (By law, the FCC must solicit comments from the

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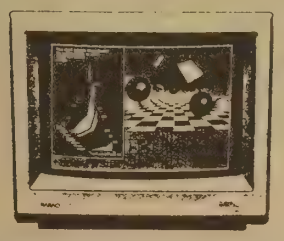

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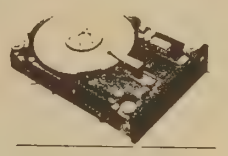

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- AT-style keyboard
- FCC Class B approved

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AT 2Meg EMS RAM card (0K)	$105.00

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public and the industry on any proposed rulings. After the initial comment phase the FCC then re-evaluates the proposal while sending copies of all comments to anyone that provided initial comments. A second round of comments is then worked through before the Commission sets the proposal into law.)

Given the potential for private networks, the FCC is likely to be asked to consider what will be the difference in function between electronic mail provided by Telenet, for example, as opposed to one provided internally or through private lines, such as the nationwide private computer service run by General Motors.

According to FCC attorney Milkman, the determining factor for applying access charges will be whether switched facilities will be used, such as those used to connect CompuServe or Telenet facilities with the user. No access charges would be assessed if no switched facilities are used, she says. If an entire intracompany network, used to provide enhanced services within the company, was on private line, or used no local teleco exchange facilities at all, no access charges would be assessed.

"So what this ruling does is set up an inequity among all data processing providers, e-mail providers, or whatever," says Telenet's Walker. "Large companies and information providers [able to afford private lines] are exempted, while those not able to afford their own networks get banged on."

INDUSTRY IMPACT

Access charges will likely kill innovative services like PC Pursuit and Tymnet's fledgling PC Express network. "These types of services will not be possible under the proposed ruling," said Walker. "We couldn't continue to offer [PC Pursuit] at the current rate." (PC Pursuit presently costs a flat $25 per month for all the online time you can use during non-prime time hours.) Services like PC Pursuit are only possible because users are not "on the clock" when they go online.

Joseph Markoski, counsel for ADAPSO, a trade association of data processing services, rejects the idea that enhanced service providers (which now pay a subscriber line fee and local business line charge) should be subject to the so-called Common Carrier Line and traffic sensitive charges imposed on long distance companies. He maintains that they are *users*, not telephone companies.

WRITE. NOW

And then there were none.

That could be the information age epitaph of 1987, the end of low-cost (or at least semi-reasonable) information services. Fortunately, there is already a groundswell of online activism set in motion on this issue, a signal to Washington that data users are a segment of the population to be reckoned with.

The FCC is accepting comments on the ruling. *Write to them now.* Tell them what you think of the ruling. You can file your comments by writing to:

Federal Communications Commission
Office of Opinion and Review
The Secretary
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

Refer to "Amendments of Part 69 of the Commission's Rules relating to Enhanced Service Providers CC Docket 87-215." For more information you can call the FCC at (202) 632-7000. □

How To Reply To FCC Dockets

At presstime, the FCC had not yet released the docket on this issue. It may have done so by the time you read this. Check your online services daily for updates.

What follows is a net posting by Bruce Bergman of San Diego, uploaded to The WELL by Brock Meeks and printed by permission of its author. The validity of its content was verified point by point by Brock Meeks in a conversation with FCC attorney Ruth Milkman.

Ms. Milkman cautions, however, "The full text of the notice isn't available yet; it hasn't been released, it's been adopted. What usually happens is that the Commission adopts it in principle and then it takes a while to get printed and out.

"I think it's probably more effective if you wait for the text of the notice and wait and file your comments as formal comments. If you send them in now we'll treat them as informal comments and put them in the public file, which is not quite as effective. It's not as useful if you make comments without reading the notice first."

She adds that a summary of the notice will be published in the Federal Register, but that the public will have to pay for copies of the full text. For further information, call the FCC at (202) 632-7000.

—eds.

The following is a do-it-yourself-kit for responding to FCC docket 87-215 regarding amendment of Part 69 relating to Enhanced Service Providers.

Before I get started with the actual letter, let me take this opportunity to make a few comments regarding responding to the FCC. In my experience, the following information is useful and important to the success of your response.

1. If you really want to make an impression on the Commissioners, **send more than one copy of your response.** Send **five** copies. If you want to make an even better impression, send **eleven** copies. Five copies makes sure that your vote counts and provides a copy for each of the general groups. Eleven copies will get your document in the 'IN' basket of each Commissioner. If this isn't possible, even **one** letter counts as a vote. Don't send more than 11. Just 11 will do.

2. Don't send form letters. Form letters are usually not worth the effort you put into them. Why, you ask? Well, while each form letter you send gets counted as a vote, it can be rejected later. If it turns out that we win this round, it is entirely probable that **our opponents will ask to go through each and every response.** If they can show that 100 responses are identical (or closely similar) with the exception of the signature, **the 100 responses can be reduced to only one vote!** Make sure your letter is sufficiently different not to get caught by this.

3. Limit your main arguments to one page. If you want to go into more detail, augment your document with additional pages expanding on your original comments, keying to those original points. Number your points.

4. Give **reasonable reasons** why you oppose this docket. You can't just say that you oppose the rule-making without a sound, reasonable response. **Remember that the opposition will read each and every response you send,** if it can benefit them. We don't have that type of financial backing; they do.

5. Make a statement about who you are and what you do. If you have a certain expertise, or if you have a degree of some sort, **tell them that.** It counts a lot for what the commissioners think if they know you are someone who knows what you are talking about. If you run a service, are an administrator, offer services to the public, etc., briefly describe what you do and why.

6. Double-space your document. This can make the difference between your response's being read or just counted! If your response is clear, double-spaced, and concise, it will be read and given a better subjective value.

7. Get your neighbors into the act. If your friends and/or neighbors are familiar with and support you and your activities, ask them to write a letter to the FCC expressing their concern over how this docket might affect your community. If you can get local officials to do the same, great! Letterhead and many copies make the **best** response.

8. Make sure the date is on the document. It is important that the reader be made aware that this isn't an old response. Put the date on your document.

And, of course, don't ever forget to put the docket number at the top!

Lastly, remember that this is going to be a very important point in future rule-making efforts. Any time the FCC wins a battle, whether by apathy or some other means, it is a big step for them in the future. If the FCC decides in favor of this docket, it's likely that you will see more of the same type later on. Private agencies will see how easily it went over and base future requests on that information. If we win, it will make it tough for anyone to raise the issue again. If a specific proposal fails to make it through a certain number of times (because of the public's efforts), the commissioners tend to not reconsider it again during their term.

THE LETTER

Basically, you will want to create a letter which has the name of the FCC at the top, **as well as a clear pointer to the docket number.**

Here's a sample first page header:

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington DC 20554

In the Matter of GENERAL DOCKET 87-215
Amendment of Part 69 of the
Commission's Rules relating to
Enhanced Service Providers

TO: The Commission
COMMENTS OF [your full name], [any professional titles]

After you have created the header, you can begin your text, **double-spaced.**

Begin by expressing who you are and any specific titles, duties, or responsibilities that might qualify you as someone who has a vested interest in what's going before the FCC's consid-

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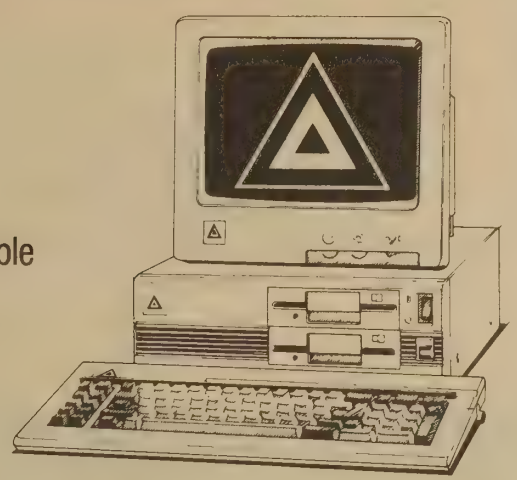

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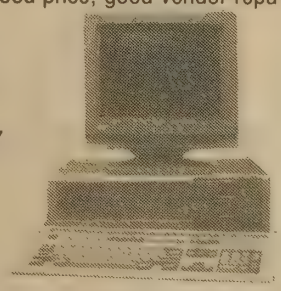

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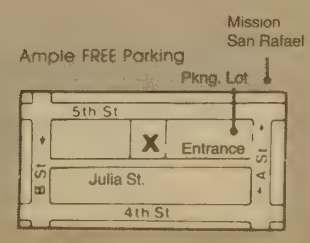

eration. Even stating that you're a user of a network is suitable. Now is not the time to be humble, however. Just tactfully explain what makes you significant to this proposal. **You're out to make an impression. Do so!** (Don't be verbose, however.)

Then, begin listing the reasons (numbered) **why** you oppose this proposal. The more reasonable, the better. Be concise and clear. If you need to go into detail, refer the reader to attached pages.

Here's an example:

I am a user of an Enhanced Service Provider. I frequently make use of such services to obtain information from computer information services that would otherwise be unavailable to me. The information I obtain allows me to [something . . .].

After you've explained who you are, and have shown why you have an interest in this docket, continue with:

I strongly oppose the Commission's proposal to surcharge Enhanced Service Providers for the following reasons:

1. [reason one]

2. [reason two]

3. [whatever comments you feel appropriate to your situation]

Remember, you don't need to be verbose to get your point across. You want to make sure the reader understands why you feel the way you do. If you need additional material in order to accomplish this, feel free to include additional pages; however, if you are only interested in making your feelings known and don't want to get really in-depth, the simple statements like the ones pictured above are sufficient to make your point.

Where you can refer to the text of the original document, do so! This is great for those who like to know exactly what you are referring to. It also shows that you have done your homework and are not just spouting off.

The best mode of attack in instances like this is to first explain why you are against the proposal. Once you have made it clear that there are good reasons why this wouldn't be a good thing, suggest alternate ideas. It can go a long way towards helping your arguments if you can suggest a viable alternative.

Finally, follow up your reasons with a nice suffix like:

Respectfully submitted,
[sign in BLACK INK]
[your spelled-out name and title]
[your street address]
[your city, state, and ZIP code]
[THE DATE]

Black ink is important when you sign your response. Also, make sure that you send the original. Copies for yourself, originals to the people you are writing to. Make sure you sign and date your letter.

If you have included additional pages, it would be wise to include a trailer at the bottom of each page, designating what page out of the total number of pages this is. Example:

Responses to General Docket 87-215
Page 1 of 3

Finally, place a return address on your envelope, place the correct postage on it, and mail it soon. If you can spend the extra cash, don't fold your responses; mail them in a larger manila envelope and keep them flat. This is especially useful if you are sending multiple copies. Chances are that it will get there in one piece, and will look great sitting on the desk of some Commissioner (flat).

The key point to remember is that you are out to make a valid point about the docket. You don't want to sound like you don't know what you're talking about, so be sure of your facts. You can best do this by being concise, clear, correct, and impressive. The impressive part comes to bear when you consider arrangement and looks of your document as well as your status in the topic under consideration. □

—Bruce Bergman

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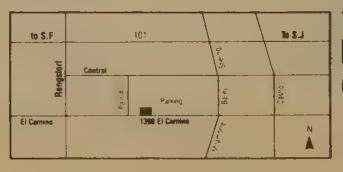

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Paging Dr. Memory:

Memory Management Concepts

By Bennett Falk

"What makes it so difficult to run UNIX on a PC?" This question seems to be about the limitations of microcomputer hardware (not just IBM-PCs and compatibles, but any single-user micro). It's a question with lots of glib answers: "The PC's hard disk is too slow," for example, or simply "Well, PCs just don't support multi-tasking; they can only do one thing at a time."

There are other earnest seekers after truth on the other side of the fence: "Why, if UNIX and the computers that run it are so great, is it difficult to run DOS applications on UNIX systems?" This appears to be a question about software design. It doesn't really have a snappy comeback, and is likely to provoke the disgruntled guru to take refuge in some arcane "awk" script.

Both are vexing questions. In spite of appearances, they are about a single, rather dry topic: memory management.

MEMORY MANAGEMENT

The use and allocation of your computer's memory requires intricate coordination of both hardware and software. Processors expect to see memory addresses in a format of some kind, a "logical address," which can be manipulated in CPU registers and turned over to memory boards to find the referenced location in physical memory.

The programs you execute contain addresses that make possible branching from one part of the program to another, and they expect to be positioned in memory in a certain way. The addresses your program contains must make sense to the CPU (usually it is the responsibility of the compiler that produced the program to assure this), and the operating system must load your program in such a way that both the CPU and your program agree on where things are in memory.

The respective memory management strategies of DOS and UNIX contribute more to the distinctive character of these operating systems than most users realize. By keeping memory management structures to a minimum, single-user systems can give users more immediate access to hardware resources.

On the other hand, the UNIX computer's ability to do several things at once depends largely on the peaceful coexistence of programs in memory. Indeed, multi-tasking is in some sense illusory: the processor never does more than one part of one thing at a time. The amazing thing about multi-tasking is that programs are kept in memory without interfering with each other.

Copyright ©1987 by Bennett Falk. All rights reserved. *Bennett Falk lives in the East Bay, works with computers and writes when time permits.*

Because DOS programs are assured of having uninterrupted access to both memory and the CPU, each program can do its own memory management. Except for the first loading of the kernel when the system is booted, however, any program that is loaded into memory on a UNIX system must share the computer's memory with other programs executing at the time.

DOS PROGRAMS AND MEMORY

DOS programs furnish a good example of how single-user memory management is done. There are two kinds of programs in the DOS world, those having the file extension ".COM" and those whose extension is ".EXE". COM files are images that can be loaded unchanged into memory to be executed. The reason they can be loaded unchanged is simply that the program happens to require no more than 64K of memory to run, and it was arbitrarily decided that the computer itself would have no less than 64K.

EXE files, because they may require more than a single 64K segment of memory, contain a header that tells the DOS program loader what is needed so that addresses for the various components of the program can be patched into the program as it is loaded. This patching assures that the program will take advantage of any optional memory the user has installed.

In either case, however, the program runs in what is called "real" mode: the memory addresses the program needs are "hard-coded" into it (either by the compiler for "COM" files or at load time for "EXE" files).

DOS programs are generally loaded into the same area of memory, and any memory addresses the program might contain are real addresses. The CPU will interpret the address to refer to one and only one memory location, since DOS congenially allocates all memory to the program. Consequently, there is little need for the operating system to manage memory; because DOS programs are assured of having uninterrupted access to both memory and the CPU, each program can do its own memory management.

UNIX PROGRAMS AND MEMORY

UNIX programs, on the other hand, do not run in "real" mode.

Except for the first loading of the kernel when the system is booted, any program that is loaded into memory on a UNIX system must share the computer's memory with other programs executing at the time. The new program will be loaded wherever there happens to be space for it, and the program can't reliably know ahead of time where it will be situated in memory during execution.

If memory fills up, UNIX will make space for loading additional programs by momentarily swapping currently running programs to disk. The "swapped out" program is eventually reloaded into memory to continue execution, but again, it will be reloaded wherever space is available. (An alternate strategy for maintaining on disk a portion of the programs currently executing in memory is called "paging.")

As if this weren't complicated enough, it's also common for several users to run the same program simultaneously, typically each with a separate copy loaded into a different section of memory.

THE VIRTUAL CONSPIRACY

These features of the execution environment for UNIX programs require more elaborate memory management than is provided by most single-user microcomputers and their operating systems. Like their single-user counterparts, UNIX programs must have some way of addressing memory, but the addresses the programs contain cannot be the real addresses of locations in

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physical memory.

The compiler producing a program to be used on a UNIX system builds the program around memory addresses that refer not to physical memory, but to a hypothetical memory in which the program could run comfortably. The program is constructed assuming a "virtual address space."

The program itself has no idea that the memory it addresses is virtual and not real. A UNIX program will "manage" its virtual address space in much the same way that DOS programs manage physical memory: as though no other program were executing in that space at the same time.

When the program is run, UNIX becomes a co-conspirator with the compiler and performs two services behind the back of the program in execution: it coordinates the program's virtual address space with physical memory, and sees to the orderly satisfaction of the demands for memory from all the programs running concurrently.

IMPLEMENTATIONS

How and where virtual addresses are mapped to locations in physical memory will vary with hardware. The address translation could be done entirely by the UNIX kernel (that portion of UNIX that controls the hardware). Independent of any user's program, UNIX maintains a number of tables which describe not only the memory requirements of currently active processes but the layout of physical memory as well. Address translation could be performed using these tables with no special assistance from the hardware.

Of course, if the UNIX kernel, which must share the CPU with all other processes on the system, is solely responsible for address translation, performance will suffer. UNIX is almost unbearably sluggish on machines like the IBM PC (based on the Intel 8088). Performance is acceptable on PC clones based on the 8086 (ATT's 6300, for example), but lacking hardware support for extended memory, the native 1MB address space of the 8086 seriously limits what could be done on such a system.

If the UNIX kernel, which must share the CPU with all other processes on the system, is solely responsible for address translation, performance will suffer. UNIX is almost unbearably sluggish on machines like the IBM PC (based on the Intel 8088).

One strategy to improve performance uses a separate hardware component (a Memory Management Unit or MMU) to perform address translation. Currently this is the favored strategy for computers using the Motorola 68000 family of processors. The UNIX kernel simply notifies the MMU of the location of the tables describing each process and the layout of physical memory. Thereafter, the MMU handles all address translation freeing both the kernel and the CPU for other tasks.

The Intel 80386 chip takes this strategy one step further by enlisting the processor itself in the virtual conspiracy. With the 386, memory management functions are built into the processor itself.

Finally, what can be said about the questions posed at the outset? On the one hand, there is nothing intrinsic to personal computer hardware that makes it impossible to run UNIX. UNIX itself is capable of performing the necessary memory management to allow multi-tasking on these machines. The limiting factors for running UNIX on personal computers are performance expectations and the increasing size of UNIX programs as the operating system continues to develop on computers with generous allocations of both memory and disk.

The problem of moving single-user applications into a UNIX environment is more delicate. The conventional (and labor intensive) solution is to port the application to UNIX: move the source code to a UNIX machine, modify it as necessary to suit the hardware and and the compiler, and then re-compile it, in effect producing a different product. Because UNIX memory management has relied increasingly on hardware, however, no one has been eager to invest in such a solution. There is instead some prospect that hardware developments could make single-user applications runnable under UNIX in their present form. With the appearance of the 386 and its support of a "virtual 8086" this far-fetched sounding solution not be so unreasonable. Perhaps we live in interesting times. □

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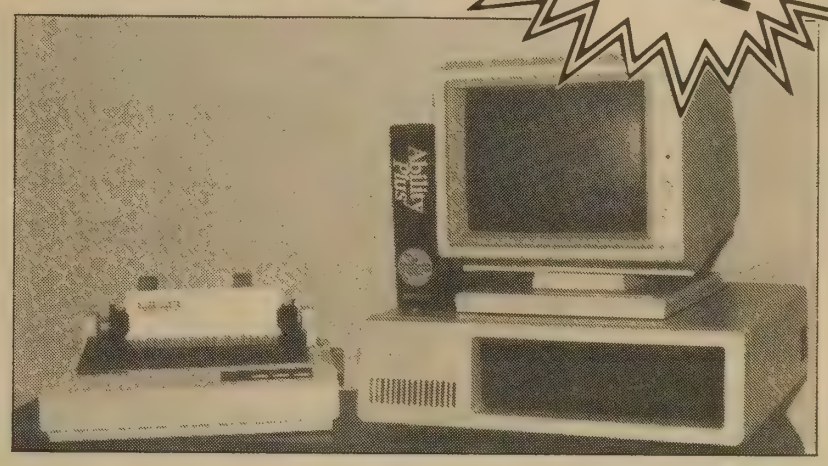

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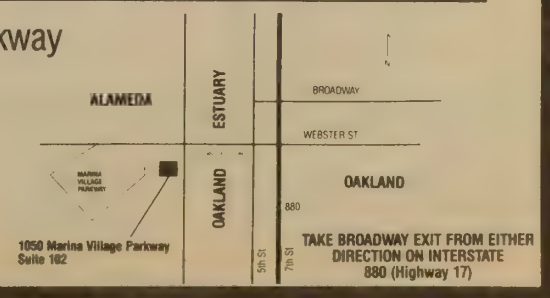

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Miscellaneous Solutions To Perennial Problems

By Ken Milburn

The avowed purpose of this column is to talk about the whys, hows and why nots of marrying various PC accessories in order to get a specific kind of job done quicker, better and easier. But some packages are solutions in themselves, or contribute to solutions in a variety of job categories. I'd be remiss not to report my experience with these stand-alone wonders. Therefore, this issue's column is devoted to them.

POINT AND CLICK DATA ENTRY

What looks like a mouse, has buttons and a tail like a mouse, but saves typing keystrokes instead of arrow-key poking? A Saba Technologies handscanner, of course. It's different from the full-page character-recognition scanners we're used to seeing. What it does is allow you lift random chunks of words off a typed page and automatically enter them wherever you've placed the cursor on your screen.

This gadget answers a long-standing prayer of mine. I get bundles of typed press releases, many of which contain small amounts of information I'd like to track. If I simply filed the pages, I'd soon drown in paper—and never be able to find the information when I needed it. Now I can simply call up ACT, wave the Saba "mouse" across the company name and watch it appear in the appropriate data field on my screen. Ditto all the other fixed fields, regardless of where (or in what order) the needed information appears on the original page. Then I can go to the notes field and just start entering any information I might otherwise have highlighted with a marker. If your typing pool spends most of its time re-keying data produced by other computers for database and spreadsheet entry, the Handscanner could repay its cost in no time.

You just can't do that with a full page scanner. Sure, some of the more sophisticated ones come with Optical Character Recognition (OCR) software that lets you scan only part (or even several parts) of a page. But I haven't seen a package yet that allows you to designate a destination location for each of these "windows." Even if you could do that, it would probably be more trouble than I'd care to invest.

There are some drawbacks to the Saba. It can recognize the most commonly-used laser, dot-matrix and daisy-wheel printer output. Still, about 30% of the typed material I get can't be scanned. Typeset, badly photocopied and marked-up originals are taboo. Accuracy depends on keeping the mouse aligned with the text, so you're bound to have to correct some errors—but it's much more efficient than typing from scratch. Also, the scanner adapter fills one of your expansion slots, and the card's 9-pin connector is easily mistaken for an AT's serial port. That's a disaster waiting to happen, because this port supplies power to the scanner. The juice could destroy some serial devices if they were absent-mindedly plugged into it.

The ProPrinter adds up to a gadget so much more efficient than anything preceding it that you owe yourself a demo.

MORE POINTING AND CLICKING

After IBM's PS/2 announcement, someone quipped that they wondered if IBM stood for "Iwanna Be a Macintosh." That's partly because the PC is rushing to become easier and more efficient to use. Part of the plan is to make greater use of graphics and point-and-click software environments like *Windows*.

Up until last week, I had yet to see the perfect pointing device. Digitizing pads are the most natural because they feel like pencil and paper. But they're tough to cost-justify and are real-estate barons. Mice are affordable and accurate enough for 98% of our requirements, but they don't work well when they encounter the note scraps, paper clips and other paraphernalia that fill my desktop. Joysticks and trackballs are space-efficient, but feel just plain peculiar.

A startup company in the East Bay, however, has the answer. It's called the ProPointer. Your existing software will think it's a Microsoft bus mouse. It needs no more space than a trackball and could even be built into a keyboard. You hold the pointer like a pencil, touching down whenever you want to "select." You can program all sorts of characteristics into it by selecting items off a menu. It all adds up to a gadget so much more efficient than anything preceding it that you owe yourself a demo. Look for it in your neighborhood store within a week or two of reading this item. I'll report on it a bit more in an upcoming graphics column. By then, I'll have had a chance to put it through its paces a bit more.

GETTING YOUR ACT TOGETHER

Most of the personal time and contact management software I've come across has been so simple (and inflexible) that you could do better by setting up a tracking system in a simple database like *PFS, Q&A* or *Nutshell* (any of which, by the way, provides all the database most entrepreneurs will ever get around to using).

Well, I've finally seen a program that could *define* personal time, expense and client tracking on the PC. It's the product of a group of former mainframe salesmen, and these folks have been trained to track time efficiently. And they know what it takes to produce a professionally commercial software product.

Called *ACT*, the program is published by Conductor Software. There are two reasons I think it will become a monster seller: flexibility and ease of use. The package uses a Lotus-type prompting menu, so there's not much computer-speak to remember. You don't have to be any sort of typist to keep complex records, either. Most fields can be filled in by picking a standard entry from a pop-up list. Times and dates are filled in by the system clock and a built-in calendar, in combination with pop-up lists that let you move an appointment, call or task ahead by an hour, day, week, etc. Onscreen status reports can be called up in a keystroke, so you can see upcoming appointments, calls that need to be made, and so forth. You don't even have to type letters, because automatic form letter generation is built in.

When it comes to flexibility, there are 15 fields that you can easily define yourself. There's also a built in reference library for any tabular information you might care to keep on line; things like metric conversions, commuter flight schedules, or UPS rates per pound. At any time while the program is running, there's a "quick key" that pops up a window for quick calls and "to-do"s that are unrelated to a particular client form. You can have as many free-form, unlimited length notes attached to a record as you want. The system keeps them all in chronological order. In fact, *ACT* keeps an audit trail on everything you've done and, where pertinent, relates these activities to contact profiles. You can also attach expenses to client profiles, then automatically generate an expense report for your boss or the IRS.

WHERE'S THE 386 STORY?

Ever since I did the feature on November COMDEX's 386 developments, *MicroTimes* has been getting letters and phone calls asking when we'd run the hands-on 386 feature we promised. Sadly, it takes considerable time for announcements to become reality.

We started out by building our own 386 machine using a RAM Systems 286/386 mother-

continued on page 168

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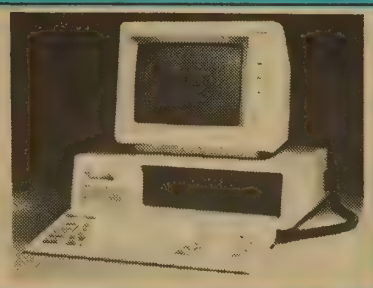

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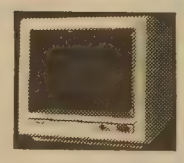

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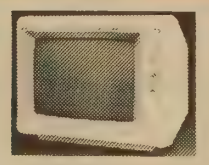

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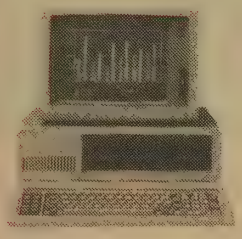

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MAC @ WORK

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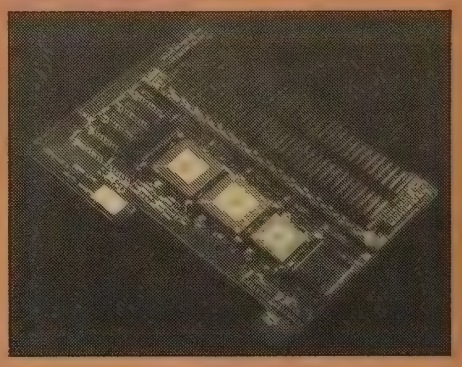

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Beyond Mac-Fattening

Third-Party Hardware Developers In A Changing World

By Robert Beauchamp

Two years ago *MicroTimes* ran an article about companies that would upgrade your Macintosh from a mere 128K to 512K—and even to one and two megabytes. Amazing stuff back then. We called it *They Want To Fatten Your Mac, With Or Without Apple's Blessing.*

Many of these companies started out as attic operations, cracking the Mac's shell and offering upgrades at a far lower price than Apple dealers. They saw it as providing a necessary service. Apple saw it as a warranty-violating infringement.

Even then, there were companies out for the quick upgrade buck. But there were also those who had higher aspirations, and those companies are still in business today. The reason all of them have credited for this success is Service, Service, Service! And of course a quality product.

The major shift in these companies has been a move away from supplying a single product or service to providing system solutions. By combining in-house products with Apple and other third party products they are offering systems that solve individual clients' specific needs.

Since those days there have been a number of transformations in the Mac world. One of the most significant was Apple's change in attitude toward third party developers. With the ouster of Steve Jobs came the ouster of the idea of the Mac as a toaster. With John Sculley came an open invitation to third party developers to go ahead and do their best. And they have.

Another transformation is the one that happened to these developers themselves. No longer just hotshot engineers or hardware hackers, they have matured into savvy, sophisticated business people with definite goals and business philosophies. Their plans are as comprehensive and elaborate as those of any major corporation.

Levco's Duane Maxwell: "We see a large amount of corporate acceptance, and we see a niche for systems integration. The corporate world does not want to go shopping around. I can't see 3M or General Motors or someone like that going down to the local computer dealer to buy Macintoshes."

Today they are less likely to tell you about the intricacies of their products than the intricacies of running a business in the Macintosh marketplace. Here then, in their own words, are the trials and tribulations, successes and frustrations of those who, two years ago, wanted to fatten your Mac.

Duane Maxwell, Levco

The team at Levco started their upgrade business in a spectacular way. They did upgrades right in their booth at the Macworld Expo. Today they are best known for the Prodigy board, which vastly improves Macintosh performance. Duane Maxwell describes Levco as an engineering company that spends upwards of 80% of its total costs on research and development. That, however, has not prevented him from seeing Levco as a business in a wildly fluctuating market.

"Our biggest growth is occurring now, believe it or not. A lot of people were a bit wary of what was going to happen to us when the Mac II came out. In fact, they were worried about most of the third parties. Well, it turns out it worked very well for us. Look at all the stuff we did without slots. Give us some slots and that gives us some extra room to move.

"The difference between us and the new machines and, say, an IBM third party house when their new machines came out, is great. Because those people were dealing with a machine that didn't do that much. They had slots to do every-

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thing. The new IBMs integrate the video, integrate all the serial and parallel ports and the memory all on the motherboard. So there isn't much need for 60-70% of the card manufacturers.

"In our business we've always had to deal with those restrictions. We've always had to deal with a machine that already had video and already had a certain number of I/O ports built into it. The only expansion it needed was what we were involved in, which was memory upgrade. Basically Apple has opened up the world to us and has not restricted us in any way.

"The other thing that happened to Levco, which is pretty unique, is that we became an Apple VAR. What that does is gives us the ability to sell the entire Apple product line in addition to our own product line. What we sell under our VAR program is what we call our Prodigy Workstation, which is Macintoshes that have been accelerated using our boards.

"We have also picked up a few third party products. We are positioning ourselves as a one-stop shop for the corporate client. A lot of these new machines, including the Mac II, are very powerful machines, and in our opinion the average Apple dealer is not capable of properly supporting the product to a major corporate client. We can sell entire systems and provide the after-sale support. One part of Levco is turning into a systems integrator.

"Our relationship with Apple is becoming steadily tighter. We trade a lot of information and things that we discover and give to them, and if there is something they feel will affect us they let us know about it.

"After Steve Jobs left things became very open to us. Almost immediately after that there was a tremendous shift, and we became almost legitimate in many ways. We could talk to them, and there was a tremendous exchange of infomation.

"We are expanding into this corporate world. We see the market changing. We expect a lot of corporations to start making heavy investments in the new Macintosh technology, because it's okay to do it now. If you really want MS-DOS, you can go buy an MS-DOS card for your Mac II. Or for your SE. So there is no real excuse for a company not to buy a Macintosh.

"In many ways the software is far more sophisticated now. You start seeing a shift now where people are saying 'when am I going to get *PageMaker* for my IBM PC?', or 'when am I going to get *Excel* for my IBM PC?' People are looking at the Macintosh as the main driving force for innovative software.

"We see a large amount of corporate acceptance, and we see a niche for systems integration. The corporate world does not want to go shopping around. I can't see 3M or General Motors or someone like that going down to the local computer dealer to buy Macintoshes. I just can't see that. We feel that the corporate world needs someone with sophistication and someone who knows the machine well.

"Apple is now encouraging the hardware developers to develop things. In fact they've laid down some pretty healthy hints about what it is that they'd like people to do. And we are developing things along those lines. Apple is aggressively helping the third parties sell their products, and that encourages us to develop more products.

"Our view is to insulate ourselves from a lot of the major fluctuations in the marketplace. We've always insulated ourselves from these things like the Japanese chip restrictions. We tend to make a Mercedes product and we're able to buffer a lot of that. We don't fluctuate wildly since we aren't in the mainstream commodity market of upgrades. We never try to be the lowest price, although on some of our products we are."

Beck-Tech's Stephen Beck: "Memory upgrades were clearly a popular category at one time. But for any company you have to look at market share and profit margins and say whether a particular product has lived its life. Products don't last too long before a better one comes along. So we're constantly in the development of new things."

Stephen Beck, Beck-Tech

Beck-Tech was already an established company by the time it went into Mac upgrades. Now, however, it has expanded into even more Mac-related areas. Stephen Beck describes the shift his company took out of the upgrade business.

"Beck-Tech is going into its ninth year as a company and its third year as a Mac product company, so the company has been doing a lot of other things beyond the Mac. In our Mac product division we went from Mac Megabytes and brought out Fanny Mac, which is one of the more popular cooling accessories. We brought out *MacMovies*, which is animation software for the Mac. It's doing very well and does some very unique things.

"We got out of the memory upgrade business because the market share was too thin, and with the Mac Plus it was quite clear that the semiconducter companies who made the SIM modules would ultimately be the memory upgraders for the Mac Plusses.

"Our relationship with Apple was always pretty good, and it's just getting better and better. We are a certified developer, registered developer, a VAR—whatever there is, we're in it. We talk regularly with any one of four or five evangelists.

"We have a whole line of products for the Mac SE and the Mac II that will be coming out in the next two years. They include graphics type products, desktop publishing hardware products, and accelerators.

"Our Chromotron was the first color video converter for the Mac, but that's sort of last year. Our product focus for the coming round is something called DTV: Desktop Television. It uses the Mac as a miniature television studio. We have a number of products coming out in the next year or two that are related to this video interface between the computer and video tape. The studio gear that does this stuff costs upwards of hundreds of thousands of dollars. With a Mac and appropriate accessories it should be possible to duplicate some of these functions with a $10,000 package.

"So we're not just memory boards and accelerators. Those are really components in our business strategy of using the personal computer as a video studio.

"Memory upgrades were clearly a popular category at one time. But for any company you have to look at market share and profit margins and say whether a particular product has lived its life. I'd say this, one thing is for sure these days—products don't last too long before a better one comes along. So we're constantly in the development of new things.

"The nature of this market is that people with good products and good support and good consistency have a better chance of survival, but its still a tough, competitive world out there."

Steve Edelman, SuperMac

SuperMac Technologies isn't Steve Edelman's first company. His first wasn't nearly as successful as SuperMac Technologies, which now will make more in one good day than it did in its whole first year. SuperMac has gone from producing memory upgrades for the Mac 128K to making its amazing 19″ color screens and other peripherals for the Mac II and the Mac SE. But according to Edelman, these products are only part of the attempt to solve a customer's problems with systems solutions. After an extended sabbatical in Asia, Edelman returned with a strong service-oriented philosophy that he used as the cornerstone for SuperMac.

"What I'm really interested in is communications among people. Right now a lot of people spend a lot of time just calling back and forth and trying to talk on the phone. We're making a class of products that integrate things in such a way that you can concentrate more and more on what you're trying to do and less and less on how it's going to get done. This class of products has a lot

SuperMac's Steve Edelman: "When we were a small company not doing particularly interesting work, Apple responded in an extremely reasonable way—they ignored us. As the work we began to do looked interesting, they began to pay attention."

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to do with interpersonal communication, networking and messaging.

"You start from the basis that people have to be happy. Then if you turn around and find out for some reason that this level of support cannot be fiscally justified on a product, then you don't do the product. The fundamental basis for a company has to be the way it treats its customers. Not its customers to be, but the people who have already paid you money. Those people have a level of happiness that they have a right to expect.

"You have to understand and feel as an absolute basis of the theology of your company that you are committed to understanding what that customer needs and wants before you decide to go into a product area.

"With regards to Apple, I would say that our relationship basically started out this way: when we were a small company not doing particularly interesting work, Apple responded in an extremely reasonable way—they ignored us. As the work we began to do looked interesting, they began to pay attention.

"Overall its support, at least of us, and I really think of third parties in general, has been pretty good. It's one thing to say, 'well gee, they don't pay attention to us.' But it's pretty incredible when you compare what they do with what other companies in any industry do. You don't find Honda or GM helping third party developers make accessories for their cars. And you don't find IBM doing a hell of a lot for its third parties. So even when Apple was getting criticized for third party support I had to say, 'C'mon guys, you're comparing Apple with Apple. You should compare Apple with everybody else.'

"In general they've just been wonderful. Overall I think the whole attitude within Apple is that if you as a third party developer seem to know what you're doing, they'll bust their ass for you. But you have to spend a lot of time down there explaining what you're trying to do and putting in the effort to tell the people, 'hey look, I'm worth paying attention to and here's why.' If you do that, they'll pay attention, and if you don't they'll say 'well, we don't understand what you're all about and we're very busy people.'

"You get out of it what you put in, and I think that if there's any piece of advice that I would give to another third party developer, its that you get out what you put in. Go down there and tell them why you're doing something interesting, because if you don't they're just not going to see it instantly."

MacMemory's Carlos Suarez: "Our major focus is to be the leading company in Macintosh peripherals. That includes the video type products, the acceleration multifunction type products and the mass storage type products. The general direction has been the same since day one."

Stacey Reineccius, Julian Systems

Like Beck-Tech, Julian Systems has moved out of the upgrade business. And like Levco and SuperMac, it has moved into putting systems together for corporate clients. They share the strategy of combining in-house products with Apple and other third party products to assemble a system that solves the individual needs of the client.

"We've gone from literally an attic operation to $2,000,000 this year, and growing past that.

"We achieved a Value Added Reseller status with Apple Computer that allows us to put together turnkey systems for music, telemarketing and telemarketing business management.

"We've turned primarily into a development and systems house. In other words, we do a tremendous number of integrated vertical market systems. That's where our primary business is these days.

"We took a focus. We started out without much financing and needed a way to do the financing. We focused heavily on products that don't conflict with the Apple warranty and don't conflict with Apple guidelines. We focused much more on the software and systems side of the business. Rather than going head to head with a multi-billion dollar corporation, we instead got their cooperation and assistance.

"Julian Systems is in business to help keep other people in business. That's the bottom line.

"I think something that would best illustrate this is in the terminology that we use ourselves. A lot of computer sellers and retailers refer to the people they do business with as customers. Customer is a one time thing. A customer is somebody who comes in, buys something and leaves with a pre-packaged small item box. And you don't care if you see them again, unless they are coming back to buy more.

"We don't do that. We refer to everyone as a client. A client is much more akin to the situation with your doctor or your lawyer or another professional, someone you build a relationship with, coming back again and again for different services.

"No matter what phase of their business they're in, or what they are doing, we're able to provide them with a continuing relationship with high quality people and high quality products.

"We're able to really provide services and products that people need to stay in business. We're here for the long run, not for a short run hit. Look back two years at the people advertising upgrades. At one time I counted 23 different organizations. Out of all those companies, I know of only three or four that are either a) in business or b) doing anything relating to the Macintosh.

"That's unfortunately a typical example of what happens very often in this market. People see a market opportunity and there's a gold rush. There's a stampede for that market. Julian Systems is trying to stay out of that. We're here to provide a consistent quality level of service for the business customer."

Julian Systems' Stacey Reineccius: "We focused much more on the software and systems side of the business. Rather than going head to head with a multi-billion dollar corporation, we instead got their cooperation and assistance."

Carlos Suarez, MacMemory

Carlos Suarez of MacMemory has also noted a tremendous change in his company. Although MacMemory no longer modifies motherboards, they still make products like the TurboMax accelerator board. Suarez credits the depth and experience of his executive staff for much of MacMemory's success.

"The company has changed tremendously since the time we were doing upgrades on the Macs and reworking motherboards, etc. Almost all our products currently do not modify the Apple motherboard and are clip on sorts of products. They're still good but we've enhanced them.

"We've also gone far on memory upgrades. We went to expanded memory on the 512E and we go up to the maximum which is 4 MB on the current Macintosh memory map.

"We have also gone beyond the memory expansion products to accelerator boards. We have targeted two different lines of accelerators—one, which we feel today is affordable, is the TurboMax. It gives you approximately 2 1/2 times the compute power at 16MHz. For the future we're designing our 68020 product and intend to release it with Apple's production release of the Mac II.

"We are also committed to a total workspace solution. We have internal hard disk products which we sell with our accelerator cards. This gives you extemely high speed hard disk access.

"I think we have an excellent relationship with Apple. We're both a registered and certified developer. We've had seed units here in house as we've been developing for the Mac II and SE. Many of our managers are former high level Apple executives. The organization is well very tuned and extremely professional.

"We have people throughout the organization who have started companies previously, and who have taken companies to fruition and have been founders of companies. We also have a fairly strong investor in the group. The company is very well positioned, we believe, to be the leader in the Macintosh marketplace.

"Our major focus is to be the leading company in Macintosh peripherals. That includes the video type products, the acceleration multifunction type products and the mass storage type products.

"The general direction to become the leader in Macintosh add-on type products has been the same since day one. The definition of how those products should look, however, has developed as Apple has developed.

"It's fairly clear where the company stands. We've tried to make it that way so that the

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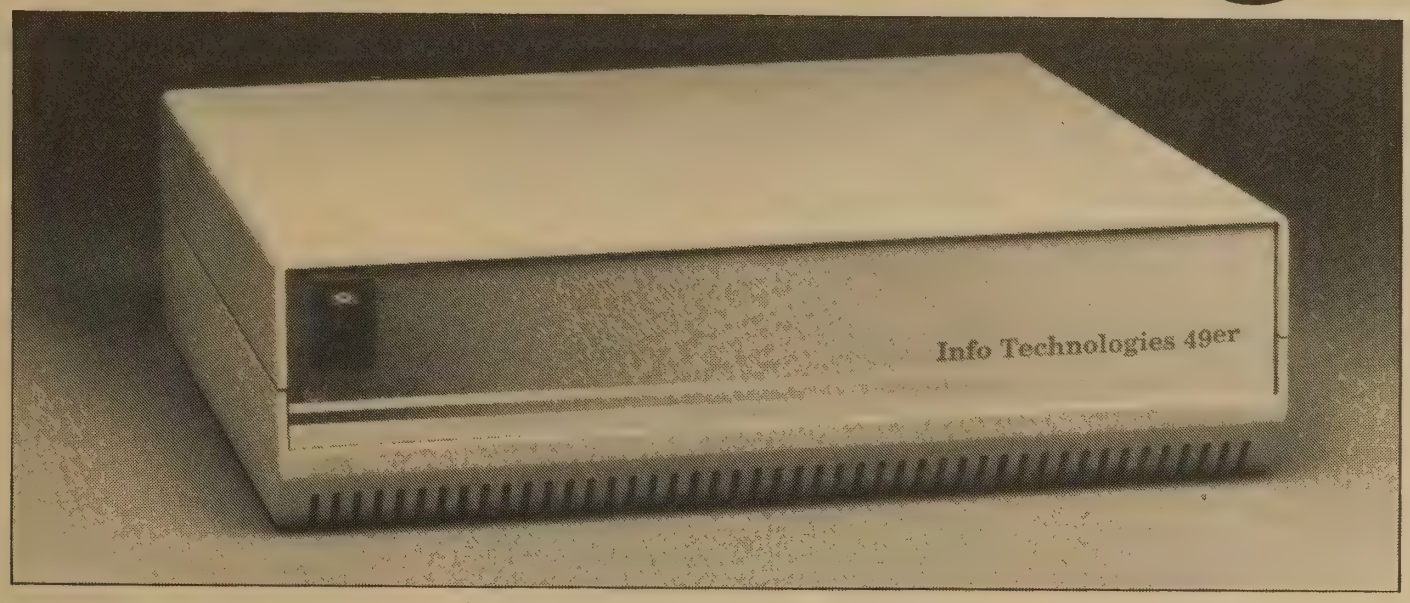

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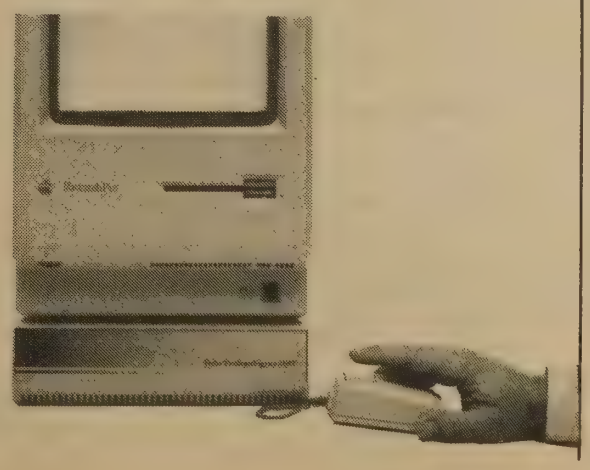

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Ron Schaeffer, Software For Less

The major strength of Software For Less, according to Ron Schaeffer, is that it keeps in stock every Macintosh software product imaginable. They also provide an extensive service program. But there are clouds in this sunny picture. While most of the upgraders have moved directly into the Apple world by becoming authorized VARs and dealers, Software For Less has had to operate without this coveted authorization. Schaeffer describes the problems of running a Macintosh oriented business in this situation.

Ron Schaeffer, Software For Less: "We aren't able to totally satisfy our customers needs without being an Apple VAR anymore. It's not that we need it to stay in business, we need it to provide the services in one location, which is what our customers indicate to us that they want."

"We've continued to grow in the Macintosh market. We're exclusively Mac and we don't deal with anything but Mac anymore. We've gone about as far as we can go without being an authorized Apple dealer. We're in the process now of trying to negotiate with Apple for a way to become an authorized dealer. We aren't able to totally satisfy our customers needs without being one anymore. It's not that we need it to stay in business, we need it to provide the services in one location, which is what our customers indicate to us that they want.

"We've increased our service department to where we're probably servicing around 200 Macs a month now. We do repairs and upgrades.

"We don't do board swaps here, we do actual repairs. We have a real hard time, however, getting parts to do our repair work, because we're not an Apple dealer and Apple makes it difficult to get parts.

times that hurts us, because the corporate people will pay more if they can get it all in one place.

"An authorized dealership is a necessity for my business to keep growing and to keep providing the service that we provide. I know Apple is changing a lot of its philosophies, and how its going to affect my desire to be a dealer I don't know.

"I know a couple of dealers went out of business in the last month or two. There are a lot of Apple dealers that can't make a living simply because they aren't full service dealers. They're just selling boxes. As fast as they get a box in they mark it up 50 dollars and sell it. That's not how you stay in business. That's just selling boxes and that's not good for Apple and that's not good for the customer.

John Sawyer, CJS

CJS is a Levco dealer and a service oriented operation that still does Mac upgrades. While Levco has benefited from a close relationship with Apple, CJS is in the same situation as Software For Less—they're trying to get VAR status with Apple and have had to operate without full support from Apple. John Sawyer says that this has not, however, prevented them from growing, and tells how the mass exodus of companies from the memory upgrade business has actually helped CJS.

CJS's John Sawyer: "What we've really gotten into more and more is repair. There are far more repairs than there are upgrades these days. There's just a group of problems that are very common, and most of the calls that we get every day are pretty much the same problem."

"But the service end of it is what we concentrate on. Everybody sells the same Mac or the same *MacWrite* or the same *MacPaint*. The difference is the way we sell it is with a lot of service and competitive pricing.

"A year ago we started a charter club. The benefits of the membership are really pretty enormous. Our members have about fifteen benefits that go along with it.

"We have a little over 2600 members in the group. It's been very successful and our volume has increased enormously because of it. The service is what people want and the service is what we give them. There are a great many of the members of Apple itself who are members of our buying group. [Guy] Kawasaki is a member, and John Sculley's secretary joined in the name of Apple.

"The authorized Apple dealership is a necessity to fulfill 100% of our customers' needs. It's very difficult for us to deal with our large corporate base and say, well we have all of *this* but you have to go over there for *that*. Most corporate buyers are in a position where they want a package. They want it, if possible, all in one place. And a lot of

"It's far less competitive now for the 512K upgrades. I know of only two or three outfits myself that do 512K upgrades within the area. People tend to call all over the place trying to find some outfit, and they generally come to us because we make ourselves known.

"We're still doing a lot of 512K upgrades and beyond 512K. 512K upgrades, however, have pretty much started to drop off. Most people have at least 512K now. A lot of the two-meg upgrades have dropped off too. I think what people are doing now is selling their Macs if they have anything 512K or less, and they're getting a Mac Plus or getting an SE.

"What we've done is go from memory upgrades, because that is not really happening all that much now, except to go to 1MB with some of the lower cost 1MB upgrades, to selling other things as well such as hard drives, floppy disk drives and some programs. We're also starting to get into some consulting and things like that. And we're looking to getting VAR status with Apple.

"If you're going to get into upgrades it's a good idea to be able to repair the things that you're upgrading. That's a problem a lot of upgraders didn't address. They knew how to simply clip out chips and put in other chips, but as to whether they could repair their work if it didn't work when they put in the upgrade or when it failed later on, that's where a lot of them fell down.

"That's part of the reason we were able to stay in business. We could fix what broke. We were very persistent as well. We just said we were going to stick it out and see what happens through all the competition and we'll see who's around in a year or two. And we managed to stay around.

"What we've really gotten into more and more is repair. There are far more repairs than there are upgrades these days. Macs usually fall apart in pretty much the same ways. There's just a group of problems that are very common, and most of the calls that we get every day are pretty much the same problem. It boils down mostly to the Mac's analog board. There are some parts that just tend to fail. It's the video section that has failed. And we do repairs for that every day. The logic board, however, is a lot more reliable.

"It's been a nice change. The upgrade business gave a lot of people the opportunity to break away from their old jobs and do something with a little more independence. That's what I've found here. It's been pretty grueling, but at least there is some sense of control. It took a lot of people away from things that they were doing that weren't so interesting and got them into a more interesting field."

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Mountain View, CA
94043
(415) 964-8884

CJS
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Berkeley CA 94703
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MacMemory
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Computerizing Your Business

. . . a buyers' guide for businesses and professionals

Analyze Your Needs

When Julian Systems is approached to develop a business computer system, our first question is, "What do you need your system to do?" You can prepare in advance for this all-important question by examining the way that your business works.

Ask yourself a few questions:

- What are the major tasks that keep your business running?
- Of these, which would benefit from automation?
- How many individuals are involved in these tasks?
- What information do they need to share?
- What does each need to do individually?
- Do you need telecommunications?
- What computer systems are your employees familiar with or attracted to?

The answers to questions like these will provide important clues in determining the right combination of hardware and software, to maximize the effectiveness of your investment.

Select Your Supplier Carefully

In most cases, the key to successful computerization lies not in the hardware, but in the supplier.

To get the most out of your computer system, you need expert consultation from the very beginning. Your supplier should be able — and willing — to spend the time necessary to customize the system for your business.

An effective and knowledgeable consultant can help you select the best software, steering you clear of products with functional limitations and "bugs" while assuring full compatibility. And he or she should either know your business, or be willing to take the time to learn.

Look for a supplier who can be the single source for all the components of your system. This will not only simplify the ordering and installation process. It will also make it easier for you to build a relationship with your supplier. And you'll have only one person to call when you need help.

Most importantly, look at your potential supplier's track record. Request two or more references, and call them. Make certain that the supplier has dealt fairly in the past, and has supported his products effectively. Every business computer system — no matter how simple — will require support. And every business client deserves it.

Consider Leasing

Cashflow management is one of the primary cornerstones of a successful business. And one of the best ways of making capital expenditures while keeping cashflow in line is leasing.

A well-structured lease-to-own plan will allow you to:

- Meet budget goals
- Conserve capital and credit
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- Generate a return on freed capital

For example, consider Julian Business Credit, a leasing plan that Julian Systems has developed in response to the needs of our business clients. Under the Julian Business Credit plan, our clients receive:

- **24-hour approval**
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- **Up to three (3) payments deferred** with no penalty (financing charges may apply, however)
- **One year of guaranteed carry-in service**

And Julian now offers business and professional clients **cash rebates** of up to $2,000 on lease purchases. That means no money down in most cases. In the case of larger systems, the rebate covers up to three payments.

It doesn't take much imagination to see how a leasing plan like this can allow you to make capital purchases while keeping your cashflow picture bright.

Service Contracts

Business computer systems see daily, full-time use. And if your system should fail, it could seriously hamper your ability to do business. So, no matter what computer system you select — or how reliable it may be — be certain that your supplier can offer you a service plan that fulfills your needs.

After all, most computer industry warranties end after the first 90 days. From there on, you're on your own. And computer repairs can be expensive. The cost of a service contract, by comparison, can be pennies.

At Julian Systems, we've developed a unique service plan for our business clients, called *Julian***Care**™. It's reasonably priced, and it offers coverage that no other computer supplier can equal.

*Julian***Care** is available in three levels of coverage. The most basic plan, **Carry In Service**, provides for repair and/or replacement of the covered equipment, including labor — but the customer must bring the machine to us. This plan is often sufficient for sole proprietorships.

The next level, **On Site Service**, provides for a technician to attempt repair at the client's premises. Since many apparent computer malfunctions are actually software problems — or simple things like dirty disk drive heads and faulty cables — they can be taken care of in a single visit, with minimal down time.

The highest level of *Julian***Care** couples On Site Service with our **Replacement Option**, providing for temporary replacement of equipment while it is being repaired. Since no business can easily afford to be crippled for days by a computer failure, most of our clients choose the full *Julian***Care** coverage plan.

When shopping for service contracts, compare carefully and be sure that you can get this level of support. Only then will you be assured of smooth, trouble-free computerization of your business operations.

About Julian Systems

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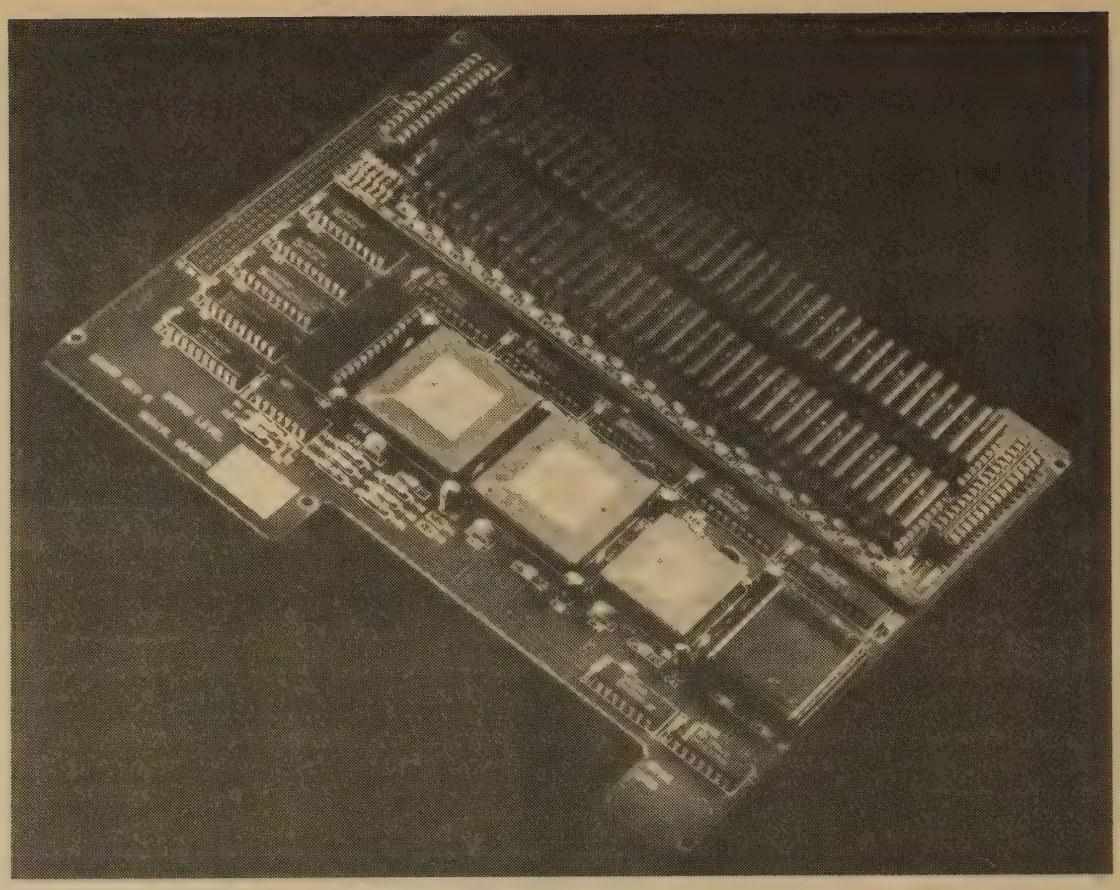

The Prodigy SE Board:
Workstation Power For Your Macintosh SE

By Jim Wolcott

For the power-user, the biggest attraction of Apple's Macintosh SE lies deep within the computer's sealed chassis: an internal, 96-pin expansion slot. This slot holds the promise of custom-tailoring the SE into an individual workstation, capable of MS-DOS emulation, high-speed networking and telecommunications, and other mega-power hardware to push the limits of the Macintosh performance envelope. Over the last few months, third-party manufacturers have been scrambling to create products to fill this slot; the first SE-enhancement product to be available in any quantity is Levco's Prodigy SE board. After working with the Prodigy SE for awhile, I can honestly say it's been worth the wait.

What's A Prodigy?

The centerpiece of the Prodigy SE is an on-board 16-MHz 68020 central processor (same as the upcoming Macintosh II), bypassing the SE's stock 8-MHz 68000 processor. Unlike the standard 68000 CPU, the 68020 processor affords a true 32-bit data path: standard Macintosh applications run somewhere between four and 10 times faster on the Prodigy SE than on a standard SE.

In addition to the 68020, the Prodigy SE features a "modular construction," allowing the installation of Motorola's 68881 math co-processor, as well as a 68851 Paged Memory Management chip. In standard configuration, the Prodigy SE is shipped with one megabyte of RAM memory, and is available in 2-meg and 4-meg onboard configurations. The Prodigy SE's internal Memory Expansion Bus is designed (in conjunction with the 68851 Paged Memory Management chip) to support up to 32 megs of RAM, a mind-boggling notion. (Imagine dumping the entire contents of a 20-megabyte hard-disk drive into RAM memory —and still having 12 megs left over for loading applications under *Switcher*!)

Prodigy Background

The Prodigy SE is actually a second-generation Prodigy. About a year ago, Levco shocked the Macintosh world with the introduction of the Prodigy 4, a board which included a 16-MHz 68020 CPU, a 16-MHz 68881 co-processor, and four megs of onboard RAM memory.

At the time of the Prodigy 4's introduction, its price was also shocking: $6,995. A year ago, the chips involved with the Prodigy 4 were barely in production, and the component parts alone cost nearly $5,000. Fitting the Prodigy 4 to a Macintosh was a formidable challenge: though mounted entirely within the Macintosh, the Prodigy featured a separate power-supply chassis and a cooling fan to keep the Mac from reaching critical mass. Installing a Prodigy 4 was, and is, tricky business.

Even considering its steep price, the problem for the Prodigy 4 was that few dealers were equipped to demonstrate the advantages of the upgrade. Worse, future compatibility of the 68020 CPU was in question: Apple Computer had not formally announced the configuration of the rumored Macintosh II, and potential customers were reluctant to commit to the Prodigy 4. Still, several hundred Prodigy 4s found their way into the field, primarily as engineering workstations, CAD/CAM applications, and for programmers compiling massive strings of code.

The Prodigy SE

The introduction of the Macintosh SE, and of the Macintosh II, changed the Prodigy situation entirely. The Macintosh II, with its 68020 CPU, ensured future compatibility for the Prodigy 4. More important, the Macintosh SE, with its built-in cooling fan, improved power supply, and built-in expansion slot, invited a second-generation Prodigy, one that could be entirely self-contained on a plug-in circuit board.

Installing the Prodigy SE is simple and straightforward. Though Levco recommends the installation be performed by an authorized Levco dealer, a comprehensive Installation Guide is provided, and anyone familiar with prying open the Macintosh can complete the installation in about half an hour.

However, the installation of our test unit went anything but smoothly. Under the supervision of a local Levco dealer, the Engineering Services Group of Huntington Beach, we carefully opened the Mac SE, disconnected the various cables, and gently removed the motherboard. At that moment, there was a great "whooshing" sound that lasted a full 10 seconds. Examination revealed that the end of the video display tube (CRT) had broken, destroying the vacuum within the tube. It's important to note that the tube, and the connection on the end of the tube, had not been bumped or touched in any way; the tube just chose that moment to commit suicide.

Fitting the Prodigy SE onto the Macintosh's motherboard was easy. The SE board plugged directly into the socket, and four threaded, plastic stand-offs aligned perfectly with holes already drilled on the motherboard. Tighten the four plastic screws into the threaded stand-offs, and the Prodigy SE becomes a secure, integral part of the motherboard. Gone are the days of solder-on connectors and clumsy plastic clips to hitch upgrade boards onto the Mac's CPU chip. With the replacement of the CRT, and the installation of the Prodigy SE, we sealed the Mac's cabinet. The Prodigy-enhanced SE worked perfectly at first power-up.

The 68881 Co-Processor

Several Macintosh performance upgrades have appeared in recent months, most of which offer

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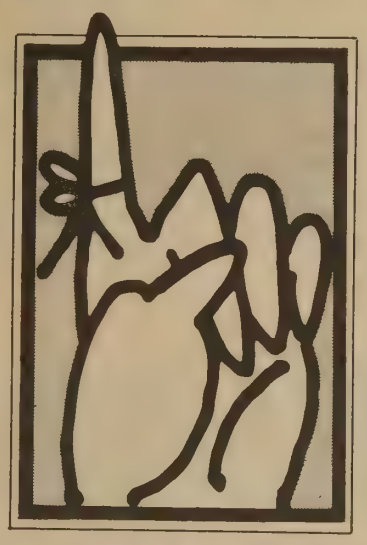

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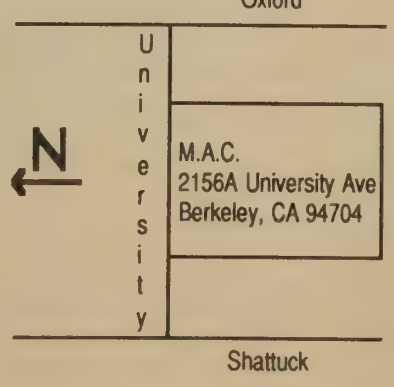

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Motorola's 68881 floating-point math co-processor. The key for performance with the 68881 is how the co-processor is "addressed" by the CPU.

With Motorola's 68000 CPU (clocked either 8 MHz as in the standard Mac, or 16 MHz as offered on some upgrades), the 68881 is considered to be a separate device within the Macintosh. Data is transferred to the 68881 co-processor and calculated; it must then be retrieved by the 68000 for the next instruction step. This takes time, and requires a long series of "commands" to execute the individual instructions.

The 68020 is completely different: the 68881 actually becomes a part of the 68020 CPU, and the 68020/68881 combination adds a new, high-performance "instruction set" to the Macintosh. Command routines that require as many as 40 separate instructions with the 68000/68881 combination can be executed with a single instruction on the 68020/68881. With the 68020, the addition of the 68881 represents a genuine "co-processor," a much-expanded and more powerful processing device. For software designed to make use of the 68020/68881 combination, the difference in speed is night-and-day.

Performance

Our test unit was equipped with the optional 68881 co-processor, and two megs of RAM memory. On power-up, the screen shows a handsome "Prodigy SE" logo, shortly followed by the "smiling Macintosh" icon (a slightly different icon, one with fangs protruding from its smile, hinting at the power within the upgrade). In a few seconds, the Finder appears—standard Macintosh stuff.

For the Macintosh SE, Levco provides a "Control Panel" file on a separate floppy disk, used to adjust the parameters of the Prodigy SE. Copy this file into the System Folder, access the Control Panel, and a new option appears: an icon depicting the Prodigy SE circuit board. Clicking on this icon brings up a fresh Control Panel screen, with control options for the Prodigy SE. This screen allows the 68020 "Instruction Cache" to be toggled on and off, and, if your board is fitted with the 68881 co-processor, allows the 68881 to be enabled or disabled. At the bottom of the panel is an option for the "*MacWrite* 4.5 Sniffer"; *MacWrite* was written long before the 68020 processor was anticipated for the Macintosh, and this feature enables *MacWrite* to function within the new architecture of the 68020.

Aside from the special setting required for *MacWrite*, most applications tested with the Prodigy SE ran flawlessly.

Some Macintosh applications instantly bomb when run with the 68020 CPU. To counter this, Levco has engineered a process to disengage the Prodigy SE board and return the system to a standard Macintosh SE. To disengage the Prodigy board, begin by Shutting Down the Macintosh, and turn off the power. Hold down the "Interrupt" switch on the side of the Macintosh, and turn the power back on. Hold the switch through the start-up "bong" sound, and the Macintosh fires-off as a standard, no-option Macintosh SE.

For example, *Tempo* is one application that crashes instantly in the presence of a 68020 CPU. For power-users who rely on *Tempo*, simply disarm the Prodigy board, run your various *Tempo* macros, save the file, Shut Down and re-start the Mac as a Prodigy SE.

In terms of software compatibility, the Prodigy SE was amazing. The few applications that refused to run with the 68020, even with the 68020-cache and the 68881 turned off, would run just fine after using the "interrupt" switch to disable the Prodigy SE board. Surprisingly, many games would run with the Prodigy SE engaged—at a speed guaranteed to challenge any arcade champion!

RAM Disk

Part of the Prodigy SE package is Levco's Prodigy RAMDisk software, a recoverable RAM-cache application tailored to the needs of the 68020 CPU. The RAMDisk allows any combination of files and applications to be copied directly into RAM memory, enabling applications to be "launched" directly from RAM—a lightning-fast process.

The Prodigy RAMDisk can create create a separate file, allowing a certain configuration to be automatically started with the Macintosh's "Set Startup" feature. Since the RAMDisk is recoverable, files "saved" to RAM memory, but not yet saved on a disk, will survive a system crash ("bomb" message). Though the Macintosh is designed to perform a RAM memory check on startup (which destroys the contents of the RAM memory), the Levco RAMDisk software circumvents that memory check to protect the contents of RAM memory.

Benchmark Tests

The increase in processing speed for the Prodigy SE is dramatic, even for the casual user. Create a long document with Microsoft *Word* 3.0, touch the scroll bar, and the text instantly flies up the screen. Search for a single word, and it appears instantly. With the Prodigy SE, *MacLightning* was able to spell-check an 11,000-word document in 77 seconds—over 142 words per second. The same spell-check on a standard Mac SE required 242 seconds—about 40 words per second.

With the Prodigy SE, graphics applications, such as *Cricket Draw*, are much faster, enabling the high-speed scrolling of a complex image. For our evaluation, we tested a Prodigy SE equipped with two megs of memory and the optional 68881 math co-processor. Since Microsoft's *Excel* spreadsheet is designed to take advantage of a 68020 CPU/68881 co-processor combination, a sample spreadsheet was created, with 10,000 cells programmed to calculate the square root of a constant located in cell A1. When the constant in cell A1 was changed, a standard Macintosh Plus was able to recalculate the entire spreadsheet in 31 seconds. A standard Macintosh SE recalculated the same spreadsheet in 27 seconds (due to the different way the SE divides its work between the 68000 CPU and screen input). For the Prodigy-equipped Mac SE, the same spreadsheet recalculated in a mere seven seconds.

Next, we ran the standard Sieve and Whetstone benchmarks, compiled (by Consulair) in *Consulair Mac C*. All tests were conducted with System 4.0 and Finder 5.4, as recommended for the Macintosh SE, with Apple's RAM cache turned off. The Sieve test on the Prodigy SE calculated 1899 primes in 1.00 seconds; a standard Mac SE required 3.18 seconds. The Whetstone? The Prodigy SE clocked a whopping 638,297 Whetstones/sec, versus 7,249 Whetstones/sec for the standard Mac SE. A sixth-order Butterworth filter, compiled in FORTRAN, ran in 17 seconds on the Prodigy SE, versus 53 seconds for a standard Mac SE.

Other Considerations

Considering all the hot-rod speed available with the Prodigy SE, it figures that there would be a glitch or two with its operation. First of all, our Prodigy SE was one of the first batch shipped, and, on occasion, it would refuse to format blank 800K floppy-disks. Levco located the problem in their PROM chips two days later, and promptly supplied revised PROM chips which cured the problem.

The Prodigy SE is designed to be compatible with most SCSI hard-disk drives, but there a few (notably those that violate Apple's guidelines for external SCSI devices) that won't work with the Prodigy SE. At this time, General Computer's Hyperdrive, all SCSI drives from AST Research, and the LoDown SCSI hard-disk drives are incompatible with the Prodigy SE. Levco can supply software to re-format some of these hard-drives for compatibility with the Prodigy SE. It's likely that the manufacturers of incompatible drives will be scrambling to create revised formatting software, since drives that don't work on the Prodigy SE probably won't work on the upcoming Macintosh II.

Since the Prodigy SE electrically resembles the Macintosh II, software programs incompatible with the Prodigy SE's 68020 CPU will soon be re-written for compatibility. The existence of the Macintosh II ensures future compatibility for the Prodigy SE.

What It Costs

The performance improvements available from the Prodigy SE carry a substantial price tag, and will appeal to Macintosh professionals who can directly relate their earnings to their computer's processing speed.

The "base model" Prodigy SE includes one meg of memory, and the 68020 CPU. (By the way, the memory resident on the SE's motherboard is bypassed by the Prodigy SE: it is used only when the Prodigy SE is bypassed with the interrupt switch.) Levco originally anticipated offering this bare-bones Prodigy for $1995, but demand for the product has enabled them to lower the price to $1495. The 68881 math co-processor is available for an additional $300, and expanding the Prodigy to two megs of RAM adds another $500 to the package. Since the various components are literally plug-in modules, the Prodigy SE can easily be upgraded to suit future needs.

Analysis

Considering the ability to engage and disengage the Prodigy SE board, Levco's Prodigy SE represents the most powerful Macintosh computer available: more flexible, and more accommodating to existing Macintosh technology, than the Macintosh II. Any application that runs on a Macintosh Plus, but bombs on a Macintosh II, can be made to run on a Prodigy SE.

Another consideration is that Levco is an authorized Apple VAR (Value-Added Reseller), and can sell brand-new Prodigy SE packages, pre-installed and ready to run. This ability sidesteps the necessity of locating a technician to install the Prodigy SE, and the down-time associated with installation. In a corporate environment, one purchase order can be forwarded to Levco, and the equipment—with full warranty—will be shipped direct from the factory.

Equipped with the 68881 math co-processor for $1795, plus the cost of a new Macintosh SE, the Prodigy SE approaches the price of a Macintosh II. But the Prodigy SE is a unique product: a compact, portable computer that emulates the horsepower of the Macintosh II, while allowing total compatibility with existing Macintosh software. Simply stated, the Prodigy SE is an astounding achievement.

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Desktop Electronic Engineering On The Mac

By A. Lizard

Computer aided design is a process whereby conventional drafting tools, such as drafting tables and paper, are replaced by a computer and appropriate software and peripherals. The user enters data into a database by drawing; when the process is complete, the information is manipulated into the data required to manufacture the product. This technology is used in architecture, mechanical engineering, electronic engineering, and other areas.

Computer aided electronic design takes place in environments from personal computers (such as Mac and IBM), to workstations (e.g. Sun and DEC MicroVax systems), superminis (such as the DEC VAX11/780), mainframe systems and supercomputers.

Personal computers tend to be used for the "front end" tasks, such as schematic entry (drafting of electronic circuits in a symbolic form), simulation of relatively simple circuits, and drafting of printed circuit board layouts which are not complex enough to require autorouting. Their use tends to be restricted to these functions even though there are software packages, usually for the IBM, supplied by IC manufacturers, which will allow for autoroute and other complex functions. The IBM systems also tend to have 32000 based coprocessor boards, and separate EGA adaptors are usually required.

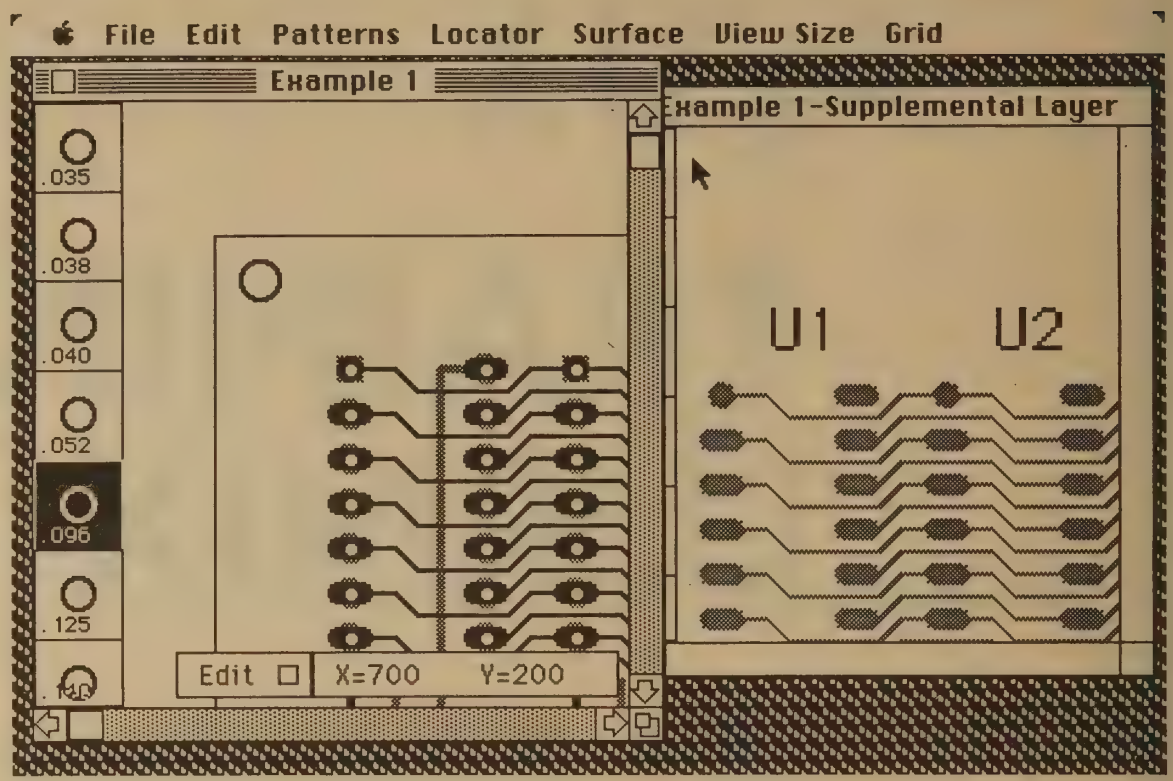
Workstations tend to be used for more complex design tasks, such as simulations of complex circuits, printed circuit board layouts requiring many layers and autorouting, design of ASICs (Application Specific Integrated Circuits—usually ICs customized according to customer specifications, such as standard cells, gate arrays, and full custom chips)

Mainframes and superminis tend to be used as workstations, except that users work in a time-shared network environment, with multiple users working on the same project database. Supercomputers are usually used in the simulation of complex integrated circuits—for example, ICs with tens or hundreds of thousands of transistors —as the simulation of each gate on an IC takes a certain length of time, which increases geometrically as the number of gates increases. A supercomputer can do in minutes what a minicomputer can do in hours and what a personal computer does in days, or weeks.

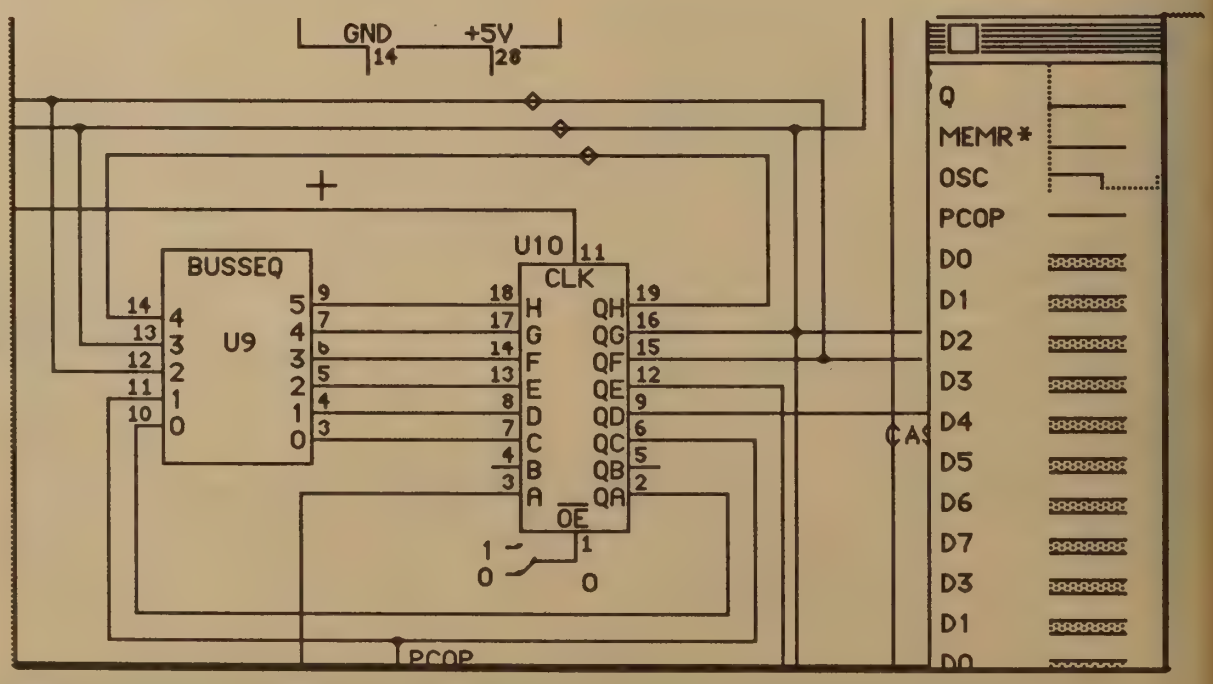
The Macintosh As The Environment Of Choice

The Mac is a superior environment for desktop electronics engineering because, unlike the IBM, the Mac was originally intended for graphics display, while the IBM was essentially kludged into a graphics environment. The only graphics advantage the IBM offered over the Mac was color, which can be added to the Mac now via third

Copyright ©1987 by A. Lizard. All rights reserved. *A. Lizard is the pseudonym of an electronics consultant working for Reptilian Associates somewhere in Marin County, providing CAD/CAM electronics drafting, circuit design, and technical writing services on his Mac. He is rumored to frequent flat rocks and terrariums. He can be reached c/o MicroTimes Magazine.*



The above is a screen from the Douglas Electronics CAD/CAM package. The left window is the actual layout—the icons are for hole placement. Right window is for silkscreen legends, for component identification, board labels, etc.



This is a screen from LogicWorks. The left window is the main schematics entry window. The right wiindow displays timing; D0–D7 are tristated.

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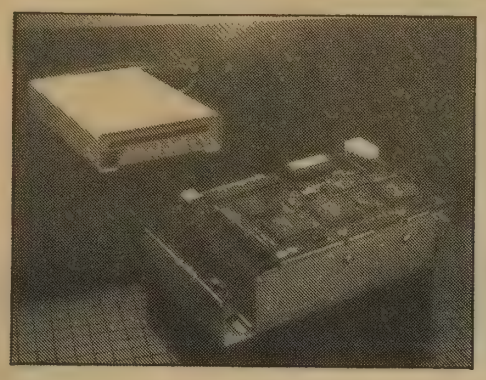

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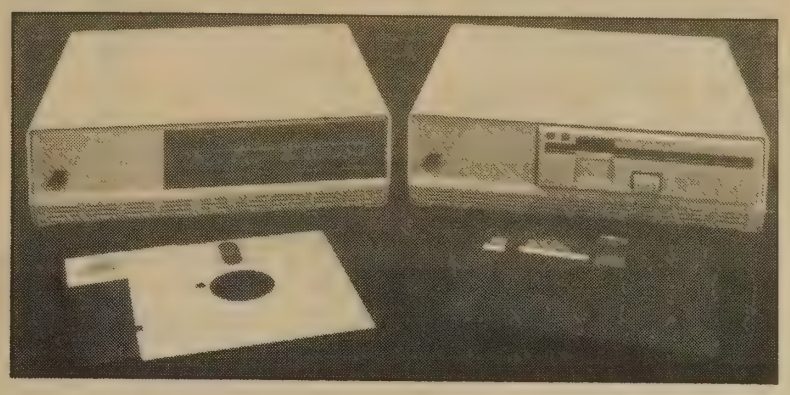

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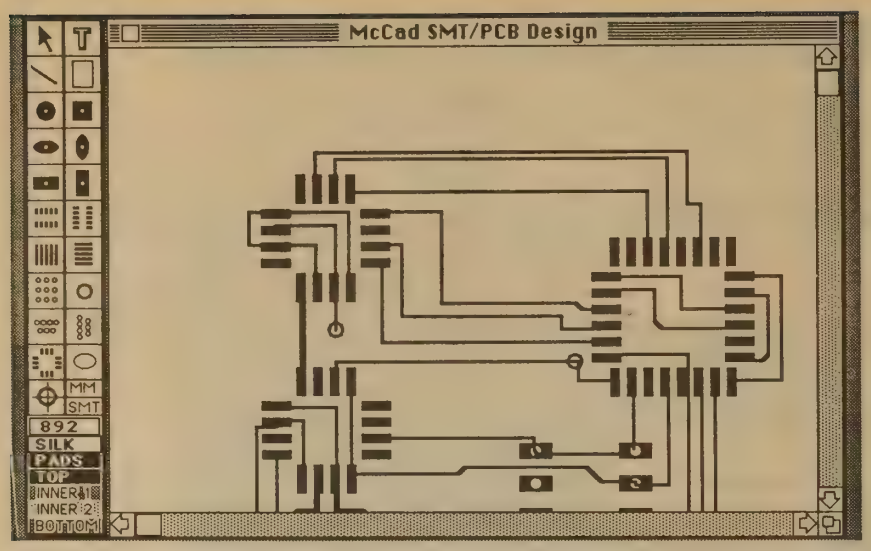
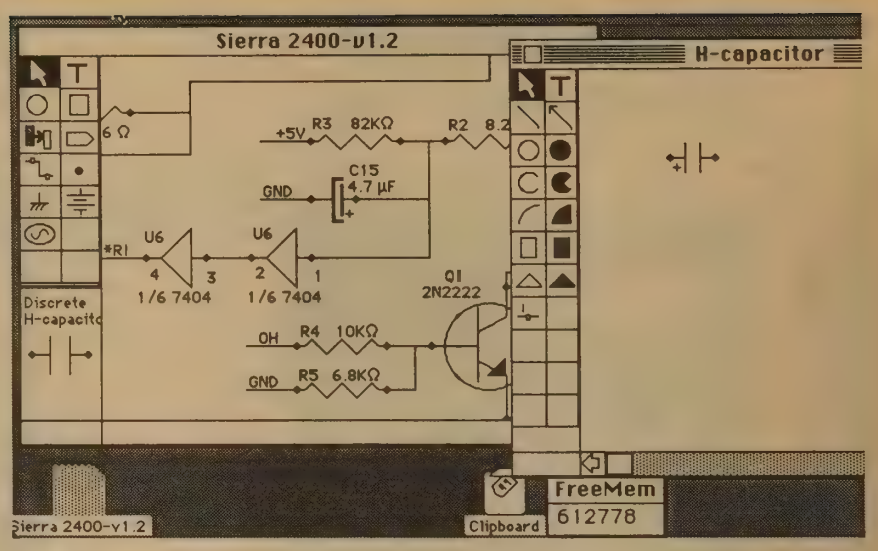


The above screen is a demo of a surface mount PC layout using the Vamp printed circuit board layout package. The icons to the left enable layers, pads, IC patterns, connectors, etc.



The window to the left displays the schematic. The window to the right is for the creation of parts (ICs and other parts that need to be added to the library to generate the schematic. The icons enable various functions (like in MacPaint or Draw).

party vendors and, of course, is built into the Mac II. Most CAD programs have some sort of color capability.

The other advantage the Mac offers in this field is flexibility. If I run out of ideas for one phase of a project, I can, from some CAD programs, dump my data into a spreadsheet for analysis, go into a desktop publishing program or other business application, without changing user interfaces. (Try dumping a *FutureNet* parts list into *Lotus 1-2-3* on IBM.)

Workstations in their current state also offer relatively limited flexibility—there aren't a whole lot of business applications for the Sun or Mentor workstations. Macs are also a bit more user friendly than UNIX-based machines.

I find the Mac ideal for the consultant or small business where it's necessary to go from engineering to accounting by changing disks. While changing disks is easy on the Mac and tends to leave you in a relatively familiar environment, the user interface on, say, *FutureNet*, a electronics desktop engineering system for IBM, is rather different from the the user interface of *DisplayWrite* running on the same IBM clone.

One problem with the current Mac environment is that it slows down drastically when working with large CAD files. However, this problem can be addressed with accelerator boards, such as the Levco Prodigy, or by going to a Mac II or an SE with a plug-in accelerator.

The other problem for would-be Mac users in this arena is that, since the IBM has been around longer and is easier to program for, most CAD products available on personal computers run in MS-DOS environments. The Mac desktop electronic engineering products are just beginning to appear. It is to be hoped, now that the Mac II is available, that major CAD software vendors in the IBM environment will be porting the software to the Mac II soon.

At this point, ASIC and gate array design software is not available for the Mac, although it is being worked on. Within a year or two, in my opinion, everything major in the area of desktop electronic engineering that can be done on IBM will be easier to do on the Mac/Mac II, and much easier to learn.

The minimum system configuration recommended by vendors is a 512K Mac with external drive. If you plan to do anything serious with any of the products described in this article, I recommend at least a megabyte of RAM, with a 68020/68881 coprocessor board, an SE or a MacII with hard disk. The alternative is slow speed and a lot of disk swapping on large files. A pen plotter is also recommended; if you are working with a D size schematic or PCB larger than 8 x 10, you will find pasting multiple sheets together a royal pain.

All major companies in this field apparently plan to integrate schematic capture, logic simulation, PCB layout, and autoroute for PCB layout in a single package of related modules.

Available Software

DOUGLAS CAD/CAM PCB LAYOUT. Douglas Electronics was the first company to do Mac CAD; their first product, a replacement for the traditional tape and dry transfer technique used in hand layout of PCBs, cost $5 a few years ago. Early users of this package will be happy to know that the old 32K file size limitation has been eliminated, allowing the designer to do much larger PCBs.

Douglas sells three versions of the package: a $95 version which supports print of PCB layout via screen dump, which I regard as unacceptable; a $395 version which supports ImageWriter and LaserWriter prints, and a $525 version which supports the above plus pen plotters.

PCB files can be sent via modem directly to Douglas Electronics, which can provide photoplotted artwork or high quality, double sided, solder masked PCBs with plated through holes, in a matter of days, with price dependent on turnaround time, size, and complexity. I can testify to the PCB board quality from personal experience with the product. Their production capability is good and standard—8 mil line lines/spaces. (This refers to the minimum trace width/space between traces that the system can reproduce on the copper in a PCB. Traces are the equivalent of wiring, the wires that interconnect components such as integrated circuits on a PCB, like the one in your computer.)

The program is easy to use, and library parts are easy to create. It is unfortunate that there is no provision for transferring library parts between files short of copying the file in which the parts you created are located, then deleting everything except those new parts. Should you need parts created in a third file, you are out of luck.

My other complaint about this package is that to print, one has to exit the program and enter special print applications programs, which can really disrupt one's workflow.

Douglas Electronics is primarily a PCB manufacturing firm with a unique, Mac based production system. Files created in this program are printed directly on either PCB or film via a Mac connected to an X-Y table with a field correction lens over the CRT, then the hole coordinates within the database are tranferred to a NC (numerically controlled) drilling machine if the desired output is a PCB. They also now have a laser photoplotter service for high quality PCB artwork.

Douglas is planning to integrate its package with *LogicWorks* from Capilano Computing to provide an integrated schematic capture, autorouting, and simulation program. (Douglas Electronics, 715 Marina Blvd., San Leandro, CA, 415/483-8770.)

LOGICWORKS from Capilano Computing is a gate level schematics entry and simulation package for circuits of relatively low-level complexity. It is useful in simulating digital circuits at the gate level, it does work, and it will generate timing diagrams, show activity at specific, user indicated nodes, and allow a high degree of interaction with the circuit as its operation is being simulated. Switch settings can be changed, signals can be changed, etc. The new version, 1.3, has had a number of bugs fixed; there is a better PROM/PLA interface, new bells and whistles, better functionality. The next version will support netlist output; this will allow the creation of PCBs from the *LogicWorks* database via a PCB layout program.

LogicWorks appears to be best suited to simulating sections of discrete logic, like address decode and clock timing in microprocessor based circuits. It is preferable to find problems like this in simulation than to build the flaws into the prototype and watch it smoke. Microprocessors cannot be directly simulated on this software, due to limitations of the Mac 512/Plus configuration—simulation takes a lot of number crunching power.

Another Capilano product, *LPLC*, a programmable logic compiler, allows generation and testing code of Programmable Logic Devices, such as PROMs, standard PALs (Programmable Array Logic), state machines, etc. It allows direct output to PROM/PLD programmers in standard JEDEC format fuse map files. This is a product which meets a real need among engineers. Now, if it would only support Altera EPLDs... Altera EPLDs (Erasable Programmable Logic Device) are a convenient way to integrate large chunks of random logic into a user-programmable chip. Its manufacturers plan to support programmable logic from all chip manufacturers who cooperate with them in generating databases necessary to work with their products. (Capilano Computing, 525 108th NE Suite 6, Bellevue, WA 98004, 604/669-6243.)

VAMP MC CAD 2.3 SCHEMATIC, PCB DESIGN. VAMP is one of the first companies to get into the Mac electronic desktop engineering business. Their products include *McCAD Schematics*, a schematics drafting package which supports autorouting of interconnections within a schematic layout, assigning symbols to nets allowing individual nodes to be connected to symbols (e.g. AØ),

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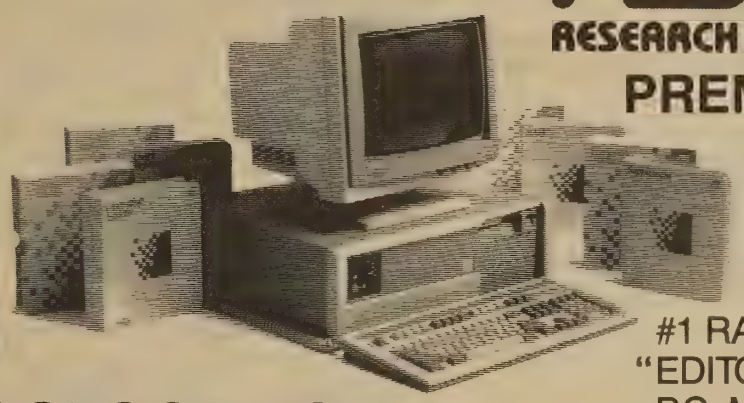

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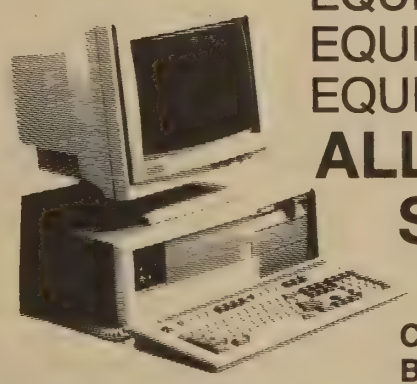

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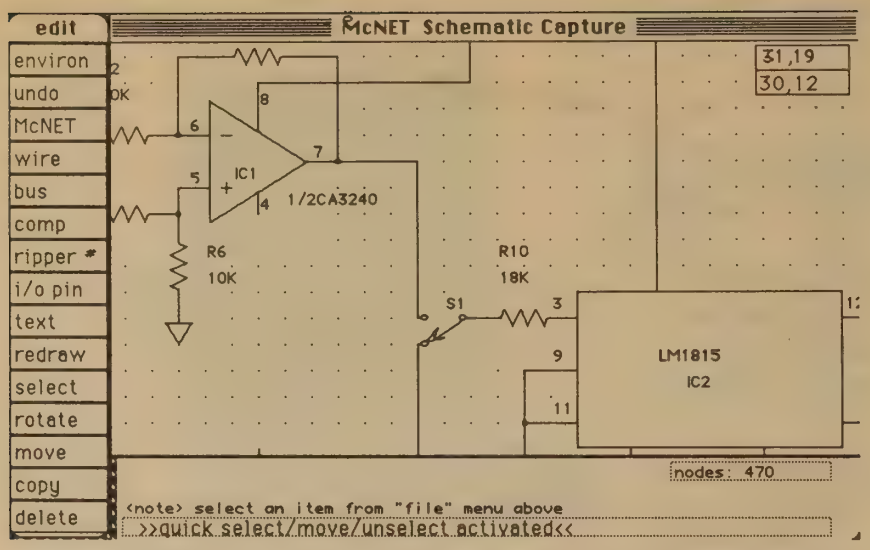

McNet was designed to simulate the working environment of workstations such as Sun and Apollo; consequently, its interface is somewhat different from the standard Macintosh approach.

McNet requires creation of a parts library by text entry rather than by drawing.

and allows the creation of new library parts on the fly, without exiting the schematic diagram for which the part is being created.

It also supports netlist output in several formats, such as Calay, ComputerVision, and Gerber. This allows transfer, in some cases via modem, of the netlist to design service bureaus or in-house PCB CAD systems, allowing PCB design directly from the file the user has created, without the problems of manual netlist extraction and transfer. (If you own this package and have version 2.2 or below, contact the factory for an updated version, which solves most of the problems that plagued earlier versions and adds many useful features.)

This program also allows dumping of the parts list into *Excel* or other spreadsheets, which I find very useful in cost analysis. (Try this with an IBM CAD package). Its worst weakness, I think, is that it currently lets you generate duplicate nodes within a net (U1-1, U1-1, U2- ...) This will be fixed in future versions.

The best thing about this package is that it is powerful and easy to use. It will print to ImageWriter, LaserWriter, and a variety of pen plotters.

VAMP also has a printed circuit board (PCB) layout package, which, like the others available for the Mac, is a replacement for the traditional tape and dry transfer technique used in hand layout of PCBs; you draw the PCB on the screen, using the mouse to draw interconnect lines. Packages and other symbols are accessed from a pulldown menu and placed where appropriate. When the layout is complete, it may be plotted or sent to a variety of PCB service bureaus which can generate artwork, PCBs, or both.

The bad news is that, as yet, this product is only a replacement for tape and dry transfer; there so far is no provision for netlist entry from *McCAD Schematics* to provide connectivity checking or autorouting, and new library symbols for permanent additions to the library are virtually impossible to create. However, this is not a problem for most users, as a very large number of standard parts, drill holes, etc., are built in, and elements already existing can be combined into the elements the user needs.

These missing features will be added in the next few months when VAMP's *EDS* package appears. *EDS* integrates schematic capture and PCB layout, and will eventually support logic simulation and autorouting.

This program has an effective copy protection scheme, which interferes with its usability in RAMdisks. The copy protection scheme is a product feature I want to see eliminated permanently.

The best thing about VAMP packages, which range in price from $175 to $1495, is their ease of use and speed of learning, due to their proper use of the Mac interface. (VAMP Inc., 6753 Selma Ave., Los Angeles, CA 90028, 213/466-5533.)

ARGUS SOFTWARE'S MCNET. *McNet* was intended to duplicate, as far as is possible, the functionality and productivity features of traditional workstation (Mentor, Apollo, VAX) CAD systems. This should appeal greatly to those engineers who use these systems on a regular basis.

The user interface on this system is decidedly different from the standard Mac user interface, but it only takes a few hours for a Mac user to become accustomed to the user interface on the *McNet* portion of the program. The designers of this program had different things in mind than the average designer of Mac software—you can do things here one can't do on the VAMP package (e.g. busing of things like data and address buses that look like industry standard, with a single heavy line branching off into smaller individual connect lines to the individual chips). If you're thinking of doing schematic layout for the Mac with this system, I strongly recommend trying the $15 demo disk first.

The program is password protected; passwords are issued to the individual buyer by Argus. While this is a minor nuisance, it is a distinct improvement on normal copy protection.

The only serious drawback of the *McNet* program is the process for creating parts in a parts library. The user is expected to create an ASCII text file that contains a complete physical and electrical description of the unit described. Unlike most CAD programs of whatever description, *McNet* offers no menu- or dialog box-driven setup procedure for part creation. There is a component template, but all it does is tell you what you should type into the text file. You do not draw new parts on the screen, you type a description like the one above, directly using the Mac QuickDraw ROM commands, the ones the user interface is designed to isolate you from—for good reason.

However, since the library creation is not part of the main program, a companion program could be created to add a user interface for library creation. Personally, I think this should go into the very next revision. Argus Software agrees that it's a problem and eventually intends to fix it.

Another problem is file size—a simple circuit with two ICs, one transistor, two coils, 19 resistors, one bridge, one transformer, nine caps, and two voltage regulators takes up 82K. However, in fairness, I will note that the items documented under "info on the component file" are relevant and a good idea, and the extra info reflects the fact that electronic data (e.g. propagation delay) must be included to drive the simulator.

This package does not currently have a corresponding PCB package; I understand that one with autorouting should be available soon. It also does not support pen plotters. It will support a simulator shortly.

The good news about this system is that it has a nice busing facility, supports multiple pages and hierarchial top-down design. The TTL parts library has more parts than many TTL databooks I've seen, and is much larger than that of competitive products. The package has been relatively stable, usable and crash free.

The message window is also a worthy contribution to Mac CAE—it provides status messages, user prompts, and error messages. The fact that this information is in a separate window makes it possible to control the presentation. On Macs with multiple screens, you could put the window in a separate screen. (Argus Software, Marketing Division, P.O. Box 1033, Stone Mountain, Georgia 30086-1033, 404/296-9666.)

The choice between the two currently available schematic drafting programs is, in the final analysis, a matter of personal taste. Just remember that if you need a schematic drafting package, it will be your most important working tool, and if you find that you hate things about it, you may have to live with your mistake a long time. I recommend buying the available demos, finding a friend with the software, and in general trying before you buy.

DIGITAL LOGIC SIMULATOR by Brian Rauchfuss is a shareware package which, in my opinion, is an excellent way for students to learn the basic concepts of digital simulation. It does not provide mainframe-class simulation, but it's cute and easy to use, and, within its limits, works. It's only $15 for registration and probably available for download on a BBS near you. (Brian Rauchfuss, 8915 N 13th Ave., Phoenix, AZ 85021.)

Wish List For The Future

I want to see everything available for electronic desktop engineering in the IBM AT environment at the functional level available on the Mac or Mac II. I would like to be able to dump a section of a CAD schematic data base directly into a Programmable Logic Device EPLDs (erasable programmable logic devices), as one can in *FutureNet* on the IBM. I'd also like to see 100% autorouting for PCB layouts, and capability for uploading to mainframes files of data compatible with standard simulation programs, such as *CADAT*, so the Mac can be used as a front end for everything.

Eventually, there will be no reason for an engineer to use an IBM PC/AT or clone, especially with the appearance of the MS-DOS card for the Mac II, which might be a good stopgap measure for an engineer until the full spectrum of desktop electronic engineering is supported in a Mac environment. □

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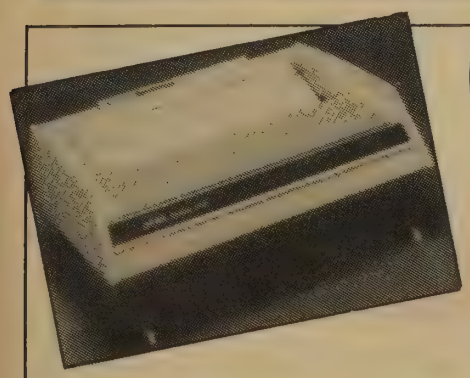

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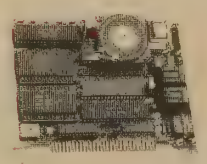

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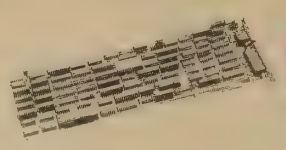

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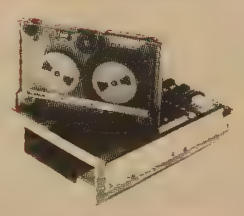

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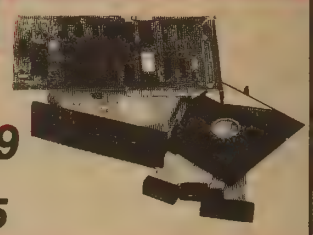

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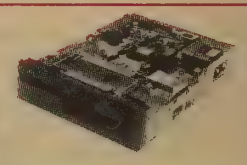

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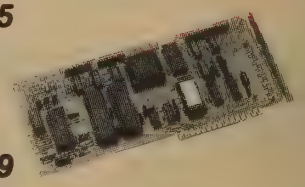

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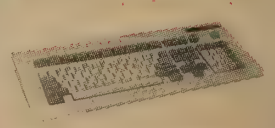

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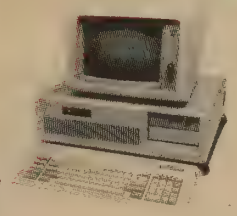

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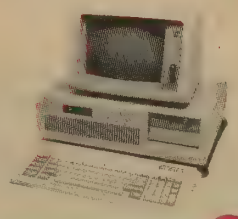

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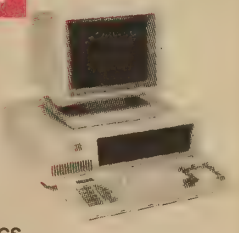

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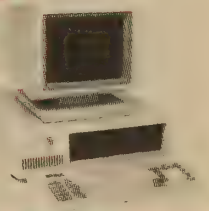

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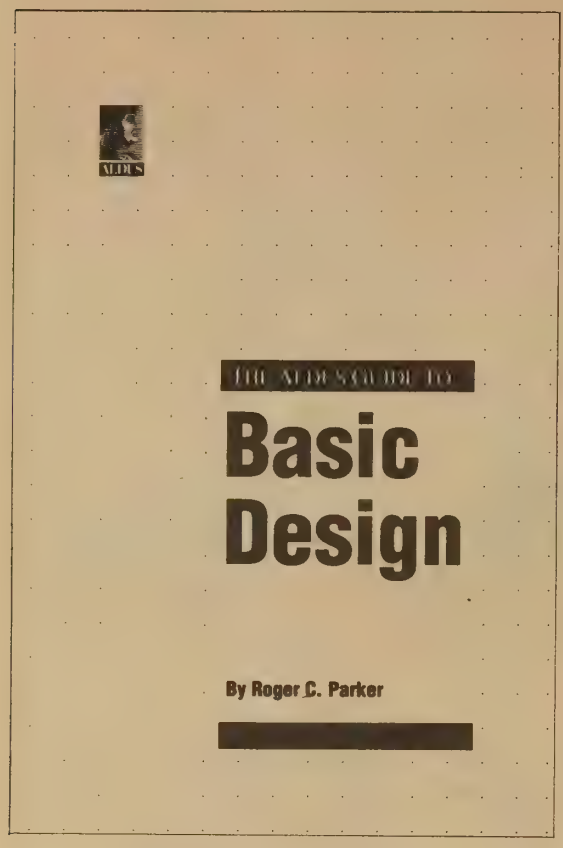
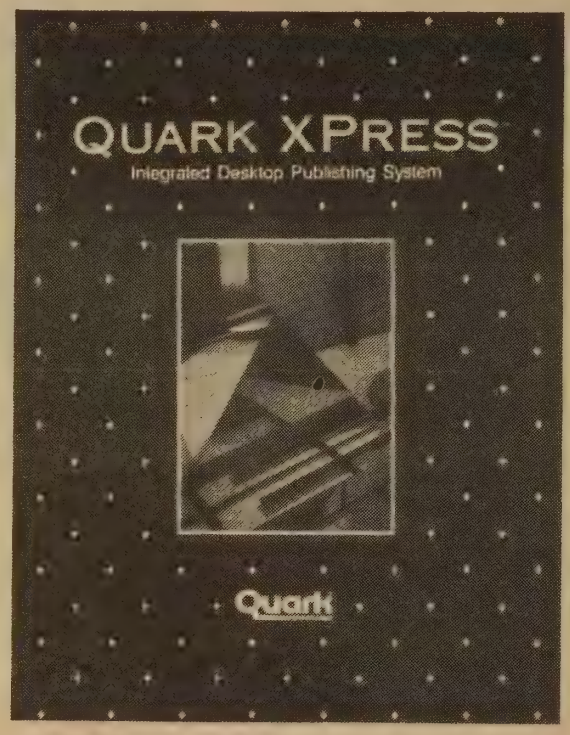


A Guide To Graphic Design From Aldus

The Aldus Guide To Basic Design by Roger C. Parker is a tool designed to help you get the most out of the latest desktop publishing software. Its purpose is to help you produce better-looking and easier to read advertisements, annual reports, books, brochures, newsletters, or any other sort of publication. It discusses concepts such as style and balance, as well as providing advice on the use of headlines, captions and type. ($6.95). Aldus Corporation, Seattle, Washington.

Stanford Professors Analyze Computers In Small Businesses

Computers In Small Business written by Russell W. Rumberger and Henry M. Levin, both of Stanford University, stems from a survey of 10,000 members of the National Federation of Independent Business (NFIB). The intent of the study was "...to examine the stimulants, reservations, means, and problems that small business owners encounter in the process of introducing new technology into their businesses."Published by the Institute For Enterprise Advancement. NIFB Foundation, 600 Maryland Ave., S.W., Suite 700, Washington, DC 20024.



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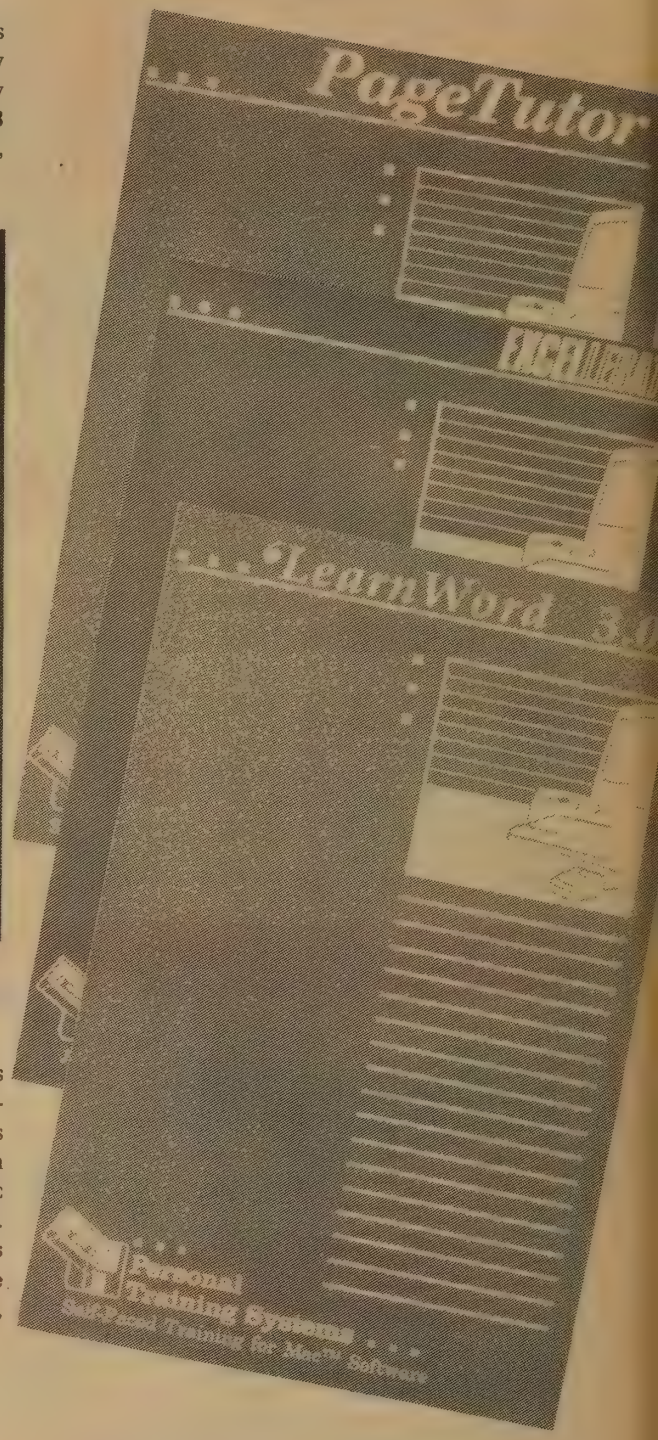

Self-Paced Training Packages For Pagemaker, Excel And Word 3.0

PageTutor, LearnWord 3.0 and *Excellerate* from Personal Training Systems are combined cassette tape and floppy disk training packages for Macintosh software. *PageTutor* is a three course instruction package for Aldus' *Pagemaker*. It has a beginning, intermediate, and a tips and techniques course. Each course contains one cassette tape and one 3.5" diskette. *LearnWord 3.0* has three courses ranging from beginning to advanced use. *Excellerate* has eight courses that train users on the *Excel* spreadsheet program. The *Excellerate* courses include Building and Using Databases, Linking and Consolidating Spreadsheets and Advanced Macros. Each course in the *PageTutor* and *LearnWord 3.0* packages costs $49.95. Each course in the *Excellerate* package costs $39.95. Personal Training Systems, P.O. Box 54240, San Jose, CA 95154. (408) 559-8635.

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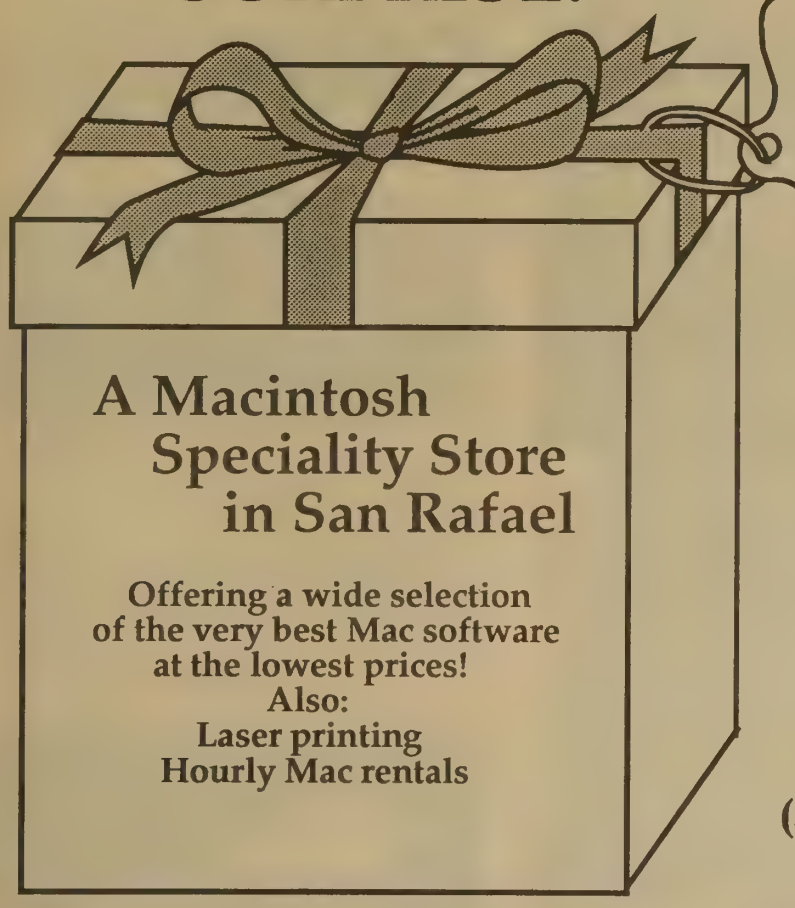

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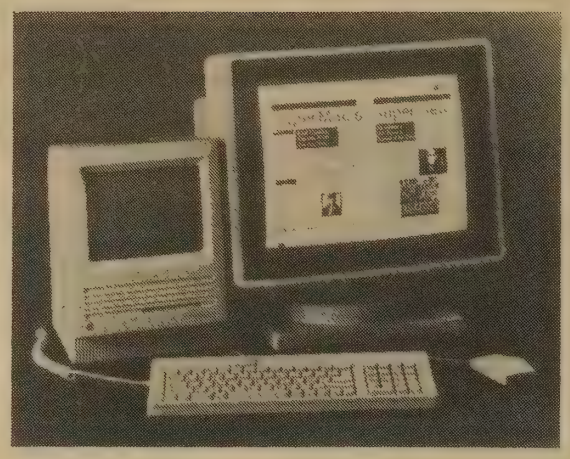
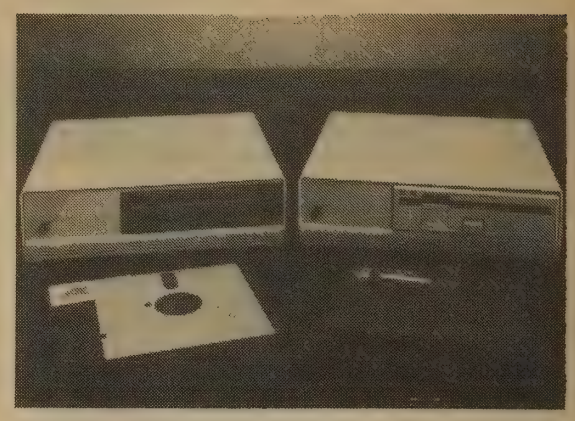
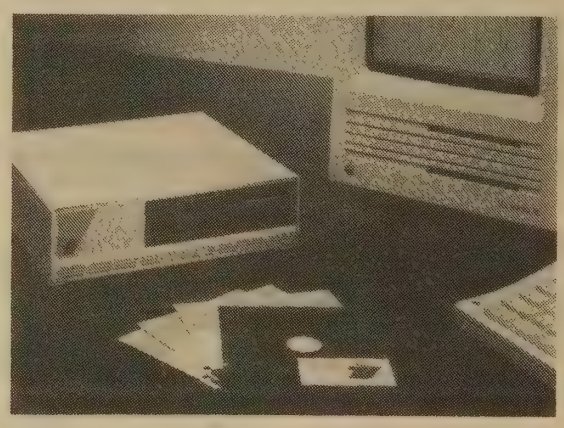


monitor. Coupled with SuperMac's 19" monitor it provides a readable image of two full-sized pages. SuperMac is also introducing two very high resolution adapters for the Macintosh II: the color graphics Spectrum and monochrome Graphix. They feature 768 x 1024 pixel resolution. Spectrum can simultaneously display 256 colors from a total of over 16 million colors. SuperMac Technology, 950 N. Rengstorff Ave., Mountain View, CA 94043, (415) 964-8884.

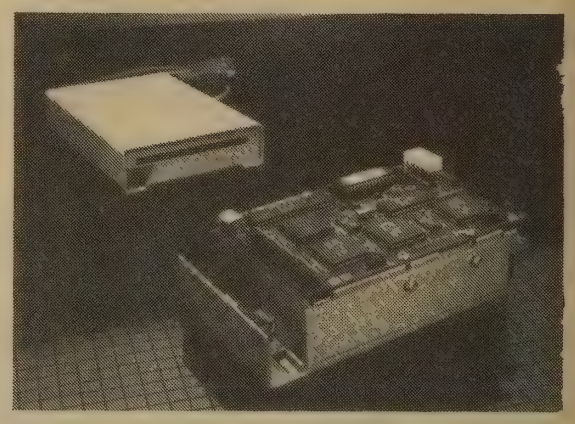


programs and data, many users can share one computer by simply inserting their personal 10MB disks. The drives can be used as a back-up device in place of a tape drive unit. The capability to read 1.2 MB IBM AT and 360KB IBM XT floppy disks in the Infinity drive provides a gateway to MS-DOS files ($1095). Peripheral Land, 47800 Westinghouse Dr., Fremont, CA 94538. (415) 657-2211.



Infinity Combines Hard Disk Performance With Floppy Disk Convenience

Infinity I from Peripheral Land is a disk drive that uses a special 5¼" high density floppy disk which holds 10MB of formatted data. The Infinity II uses a hard shell cartridge to hold the same 10MB. Both drives are suited for applications in engineering, accounting and desktop publishing. Since one floppy can hold complete systems with software



New Internal Hard Disks For The Mac SE

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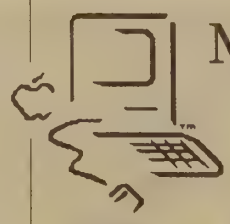

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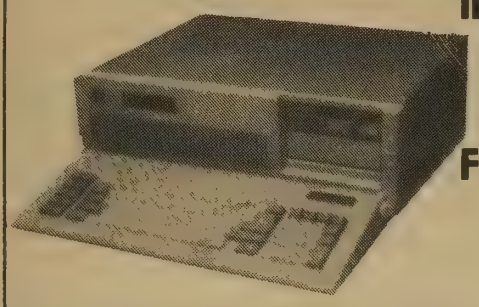

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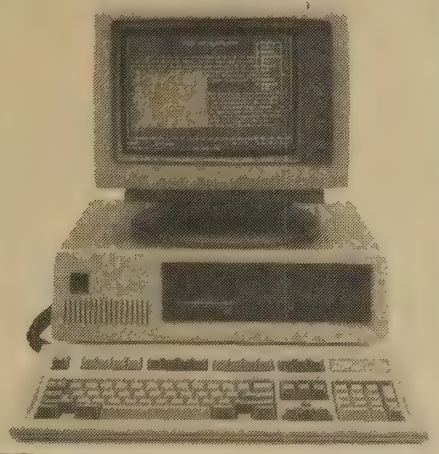

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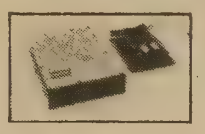

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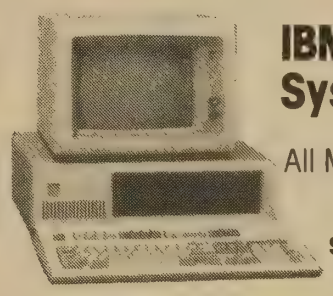

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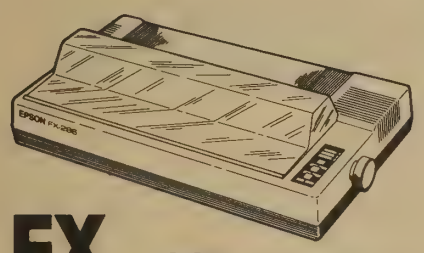

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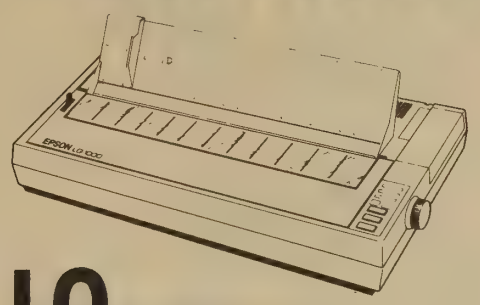

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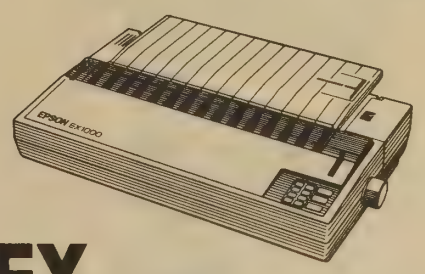

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PC Systems *continued from page 108*

board in my Blackship AT. The combination runs every bit as quickly and reliably as I was told it would. Haven't had a single compatibility problem in six months' worth of reviewing some fairly esoteric software, either. Several people were especially interested in it because this was one of the few boards announced that was small enough to provide an upgrade path for the millions of PCs and XTs.

We purposely delayed the article until we had an operating environment capable of taking at least some advantage of the 386's multi-tasking and extended memory capabilities, and until we could get our hands on at least two megs of 32-bit RAM. During the wait, RAM Systems was bought out by a larger company. RAM notified me of the change, along with the new address and phone. I scribbled the info on the handiest scrap of paper, misplaced it and haven't been able to track them down since. (I didn't have my *ACT* together...) If anyone out there knows where the former RAM Systems is, please call. I'll see that the information gets posted here.

Meanwhile, there's good news on the 386 front. The hands-on article is truly on its way. It seems that Micro1, one of the Bay Area's larger clone vendors, is building a 386/AT-compatible based on Intel's 386 motherboard. I'm using it as the basis for building a supercharged desktop workstation. The object is to see how close an end user can come to beating IBM's Model 80 at its own game—and for less money. It's going to have a 70MB Atasi high-speed drive, RLL formatted to 105MB with access times under 5ms (thanks to a new controller called the Awesome I/O), a 1.2Mb 5 1/4" floppy, a 3.5" 720K floppy (for easy data transfer with PS/2, laptop and Mac machines), a 15MB Sysgen removable media hard-drive, a 387 math co-processor, at least 2MB of 32-bit memory and high-resolution color graphics. This machine will use *DesqView* 2.0 to run both graphics and text-mode software concurrently, using currently available MS-DOS software, running in the virtual 86 mode of the 386. Besides the 3.5" drive, the keyboard (DataDesk 101 Plus) and color graphics display will reach for PS/2 compatibility. I've had most of these components installed and running for several weeks, so it's safe to say that the full report will soon become a reality.

INNOVATIVE COMPATIBILITY

AT-compatibles, including some very solid ones, are often boring in their slavish imitation of IBM's original. So I'm happy to report that Tandon, the company who brought you the floppy drives in the original IBM/PC, has brought out a fully compatible machine that solves some problems the AT doesn't address. The machine is called the PAC286. Substantially smaller than the standard AT, the machine lets standard DOS applications break the 640K barrier and has bays for a pair of removable 30MB hard drives. You can have 60 megs on line, back up one drive to another, remove both and lock them in your safe.

Of course, removable media drives like the Sysgen and Bernoulli units have been around for some time. The Tandon units aren't cartridges, but complete drives. Since they're 3.5" units, however, they're small and light enough to drop in your briefcase or to UPS across the country. Completely enclosed in a shock mounted case, they'll take heavy punishment. The normal 40ms AT drive is rated by the Advanced Norton Utilities at 2.5 times the speed of an XT disk. Tandon's built disk caching into these little packages and Norton checks them out as 3.5 times faster. Shops with several computers to support should find the PAC286 system cost effective in more ways than one. You can buy the whole system for less than the cost of dual drive Bernoulli box add-on. The whole system, including a full megabyte of RAM, serial and parallel ports is scheduled to retail for under $3,000 with one 30MB hard disk. You'll see even better prices advertised here. Extra 30 meg drives will sell for about $300, and you can have as many as you want.

The real savings for large companies are in consulting and training fees saved. A consultant can configure a department-wide software system once. Thereafter, it's just a matter of copying and distributing Datapacs. And an employee moving from one desk to another can "take his computer with him" —in the form of a Datapac.

UPCOMING GRAPHICS COLUMN

Graphics are becoming so important in the business world that *MicroTimes* asked me to start a new column on the subject. I'll be concentrating on the uses of graphics as they apply to the business world, and how they fit in the context of desktop publishing, expanded means of inter-computer communications, and the importance of integrated (read Mac-like) computing environments on personal computers. Although we'll cover applications for IBM PC/PS2-compatibles more frequently than others (because more of them exist), we'll also talk about the Mac, the ST and any other "thingamabob that does the job." □

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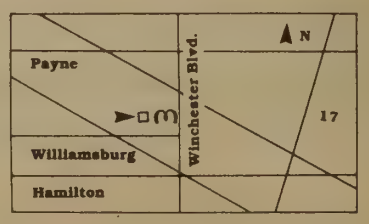

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COMDEX Report

By Matthew Leeds

Fasten your seat belts—we're moving into the future at a rapid pace. The A2000 just may become the graphics workstation of the future. I've just returned from COMDEX in Atlanta, and the products that will be available in the next six months will amaze and delight Amiga owners.

Just to bring everyone up to date, by the time you read this the A500 will be shipping in quantity, the A2000 will be just around the corner (September or October most likely), and the price increases will be old news.

What price increases, you say? CBM has raised the list price of the A500 to $699 and the A2000 to $1995. The additional revenue will be used to cover an educational three-for-the-price-of-two discount and to finance a new advertising campaign. Although over the long term CBM will most likely discount these new machines, they have also begun to realize their true market value and the need to put some cash in the bank, as well as to increase the installed base.

On to some of the new products I saw at COMDEX. *Microfiche Filer* is a new kind of database program which lets you mix text and graphics as a single record in a file. Records are stored as a two dimensional sheet, like a microfiche. The data is displayed in a condensed form, and you drag a magnifying glass over the form to see the data contained within.

The program uses a data compression technique to squeeze pictures so that several can be displayed on the screen at once; pictures of any size can be displayed, even those larger than a full screen. This is the first database program that I've seen for the Amiga that may fulfill the promise of an elegant integration of text and graphics with the full power of a database's retrieval capabilities.

Taurus showed a line of software for the Amiga that has been used on 68000-based workstations in England. *X-CAD* can display 3,000 lines per second from a database of 30,000 lines. It can provide net lists, plotter output, Ethernet support, on-line help and documentation with both text and graphics. A version of *X-CAD* includes a program development system, effectively creating a CAD operating system. Other upcoming products from Taurus include a vector font publishing front end for *X-CAD*, a page makeup program, and a Genlock hardware device.

Intuitive Technologies, the same programming crew that brought you *MaxiPlan*, is about to unleash three new products that they will be marketing directly. *WOW!* is a disk cache program that improves the apparent speed of your floppy disk drives. It uses smart buffering to keep commonly used data in memory, and it can fetch information before your Amiga knows you want it. *Encore* is a keyboard and mouse macro utility. It will record your keyboard and mouse actions, store them, and play them back at your request. *ShortCut* is an abbreviation dictionary. It remembers your abbreviations and expands them at your command. Storage can be either in memory or on disk. You can create multiple dictionaries for any application.

Mimetics has moved into a new field. Sure they've kept their hand in the music hardware/software arena, but they are coming out with a line of hardware to be used in the video market. The ImaGen Genlock will work on any Amiga and can be used to provide composite color video output on the A500. It can also be used to overlay the Amiga's output on any external video source. The overlay function is software selectable. The FrameBuffer is a 24 bit video imaging board that will allow the Amiga to display over 16 million colors. A FrameCapture option will capture video frames in real time. The VCR Synchronizer/Controller lets the Amiga be used as an edit controller or frame animation tool. Finally, the SMPTE interface reads and generates SMPTE time code, letting *SoundScape* lock to any SMPTE source. Mimetics also released over two dozen new *SoundScape* modules.

Associated Computer Services is releasing an interlocking set of programs for television station graphics animation. The E/FX module is the hub of the system. It uses a storyboard layout concept to create overscan video animations. A full set of wipes, fades, pops and other transitions are available. Tweening animation, color cycling, brush animation, and remote controllable time sequencing are just some of the features designed to assist in the production of professional looking, broadcast quality animations. The *Weather Graphics* module is a full set of screens, brushes and clip art for the weather broadcaster. Also included is special download software that will tie into many of the most commonly used weather services. The Character Generator module supplies over 200 fonts in any style or color. Text can be imported from any word processor, or entered directly. Text can be crawled or scrolled from/to any position on the screen, and special effects like neon or chrome are supplied as well.

The Gemstone Group has produced a 68020/68881 add-on board for the A1000. This is a daughter board that plugs into the 68000 socket. It will sell for under $1000, and may be found below $800. The board is called Sapphire, and is available with or without the 68020 and/or the 68881 chips.

Haitex Resources will release the Memory Plus for the A2000. This is a multifunction card that provides a 68881, one or two additional parallel ports, an additional serial port, and sockets for an additional megabyte of RAM.

NewTek has announced Digi-Adaptor, a hardware product that will finally let *Digi-View* owners digitize color images directly from a home VCR. Also shown was a final release version of *Digi-Paint*, the HAM mode paint program, and *Maxine Headroom*, a demonstration version of an animation program using digitized images and sound. Look for lots of nifty new goodies coming from NewTek between now and year's end.

Byte by Byte showed *SCULPT 3-D*, Eric Graham's solids modeling and ray tracing program. Three-dimensional images are created in a wire frame environment, and then rendered in any of five IFF modes. Full control over color, texture, and shading is provided. Also announced was a memory expansion device called Advantage 500 for the A500, from 512K up to two megabytes. Software that displays a graphical representation of the RAM chips, tests each chip and flags any defective chips is included.

There were plenty of other products shown. Meridian Software showed off *Zing! Keys*, a keyboard macro program. Micro Systems Software showed a new version of *Online!*, Aegis showed *Videoscape*, and I got to meet the head honchos from Commodore. Over the next few months I'll be reviewing some of the new products for the Amiga, discussing my views on the future of the new machines, bouncing a few rumors regarding new products, and generally trying to give you your monthly diet of information and entertainment on things Amiga.

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Matthew Leeds has been using and writing about Commodore computers since 1983. He is currently Director of Marketing for Byte by Byte Corporation. He can be reached on the WELL (415/332-6106) as mklsf, or through MicroTimes.

Resources

Software Visions
26 Forest Road
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Taurus
Taurus House
3 Bridge Street
Guildford, Surrey
GU1 4RY UK

Intuitive Technologies
2817 Sloat Road
Pebble Beach, CA 93953

Mimetics
POB 60238 Station A
Palo Alto, CA 94306

Associated Computer Services
1306 E. Sunshine
Springfield, MO 65804

The Gemstone Group
620 Indian Spring Lane
Buffalo Grove, IL 60089

Haitex Resources
208 Carrollton Park Suite 1207
Carrollton, TX 75006

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From The World Of Atari

By Helmi Kobler

They said June's World of Atari show would flop. It was put together, from conception to opening day, in little more than eight weeks. It shared the month with COMDEX and the CES, two national industry trade shows that might have discouraged some already traveled-out exhibitors. And if that weren't enough, a few local Atari user groups that were expected to help in putting on the show were instead threatening to boycott. Things looked encouraging...

When I arrived at the Santa Clara Convention Center on Friday the 19th, though, it struck me that things weren't so bad. The troublesome user groups had agreed to cooperate. A few popular ST developers were absent but many still managed to make it. And they had some exciting products to show the 6,000 people who'd be attending through Saturday. I don't have enough space to list them all, but I'll cover the highlights.

It's pretty safe to say that Atari's Mega ST, laser printer and IBM PC clone were the hit of the show. Just about every attendee had heard something or other about these products since their announcement in January, but for many this was the first opportunity to see them live. Two Mega ST 4s (with four megabytes of RAM) were constantly surrounded by clumps of people. These were production models with the fabled blitter chip and revised TOS operating system ROMs installed. Everything about them seems refined—their modular design is sleek, the detachable keyboard rests comfortably in your lap and the keys have a solid, IBMish feel to them. The blitter speeds up common GEM operations such as window drawing and such, though I couldn't coax much software to run noticeably quicker with it. Changes in TOS are many; they include the ability to turn the blitter chip on and off from the Options menu of the desktop, a new folder limit of xxx and a continuous window scroll when scroll arrows are held down—no repetitive clicks. Quicker memory clearing at boot up, and faster single drive disk copying and formatting routines have been added also.

Atari says the Megas will be released somewhere in July—of this year, that is—and will run from $1500 to $1700 for two and four megabyte versions, respectively. Blitter and TOS upgrades for 520/1040 owners will probably be ready by September for $120. These involve a swap of the ST's motherboard, meaning you'll lose any piggy-backed RAM upgrades you have installed.

Atari's SLM804 Laser Printer got a good deal of attention too. It's an eight page-per-minute, 300 dot-per-inch printer that uses its host ST's processor and memory to create pages. As a result, the printer's retail price is being kept under $1500; however, it demands at least two megabytes of RAM from the ST to print full page graphics and multiple fonts. 520 and 1040 users can use it under a Diablo 630 printer driver for handsome, single font text documents, though.

Helmi Kobler took his first step into the computer world in 1983 when he walked out of Macy's with an Atari 800 in his arms. Still an Atari user, he's now inseparably attached to his ST. He can be reached through MicroTimes or e-mail <helmi> on The WELL at (415) 332-6106.

Atari's TV commercials will start airing in the fourth quarter of '87, and generally compare the 1040's memory/price ratio to the IBM PC-AT and Apple's Macintosh.

Atari also had near-finished versions of four of its television commercials playing on a VCR. The ads will start airing in the fourth quarter of '87 and generally compare the 1040's memory/price ratio to the IBM PC-AT and Apple's Macintosh. They look sharp and make you wonder "is that an Atari commercial I'm watching?" Definitely a far cry from earlier Saturday morning commercials reading "fun is back, oh yes sirree, it's the 2600 from uh-tar-ee..." If Atari's listening, however, I'd like to suggest that their ads focus a bit more on ST software performance rather than hardware. Many folks don't care whether the ST offers more K for the dollar until they know the machine can also run a good spreadsheet or desktop publishing package. Atari's commercials don't make that clear enough.

Getting on with third party attractions, I found a small Texas company called Seymor-Radix selling IMG Scan, a $99 scanner that works with just about any dot matrix printer around. IMG Scan consists of a small uncased circuit board that plugs into the ST's cartridge port and a small optical "image cable" that replaces your printer's ribbon and mounts atop its print head. Scanning is done by the cable as it runs back and forth over a paper image set up in the printer. The resolution an image is scanned in depends on the printer being used. According to Seymor-Radix, most Epson compatibles usually scan at a vertical resolution of 144 or 216 dpi, and complete a letter-sized page in under ten minutes.

Included software lets you adjust gray scale and magnification levels, and save scanned images as a *Degas* or *NEOchrome* picture. I'll let you know more on how IMG Scan performs once I get mine to work correctly! There's a lot of trial and error involved before you get a decent scan, but the final result is impressive. Seymor-Radix is at P.O. Box 166055, Irving, TX 75016.

Navarone Industries has a scanner of its own called the ST SCAN Image Scanner. The ST SCAN package sells for $1,239.95 and includes a Canon IX-12 Sheet-Feed scanner, cartridge interface, cable and software. The Canon IX-12 scans at 300, 200, 150 or 75 dpi and Navarone's software can save digitized images as *Degas* pics, and standard .IMG GEM or PostScript files. You can reach Navarone at 1-800-654-2821.

From Brøderbund Software were *Film Director* and *Art Director*, two fantastic programs that will sell as a single package for $79.95 in September. *Art Director* is an advanced paint program with features such as rescale, stretch, distort, bend, bulge spin, view perspective, scroll, scrape and so on. Features like these make *Art Director* the most powerful painting program out for the ST, but it's got one major weakness. The problem is that it works only in low resolution and, although it will import *Degas* or *NEO* pics, it will not save images in those formats. By supporting only low resolution and not providing a standard file format to save pictures under, *Art Director* limits itself to being a great paint program that's only good for creating art to add to a slideshow. Forget importing its stuff into *Easy-Draw, Publishing Partner* or any other program that otherwise accepts art from outside (except *Film Director*).

Film Director is a snazzy cell animation program that lets you design "films" featuring objects created in *Degas, NEO* or *Art Director*. Animations are created frame by frame, and music and sound effects may be added in. A free "film player" is included so people without *Film Director* can still run your animations.

Brøderbund is also bringing out ST versions of *The Print Shop* and its *Karateka* game, slated for September release. Reach Brøderbund at (415) 492-3200.

Antic Publishing got itself a booth directly across the aisle from Atari and was demonstrating its Stereotek 3D glasses from The Catalog. Just about everyone on the show floor must have tried out the glasses, but many probably missed the short demos given of two upcoming software packages. The first is called *Spectrum 512*, a low resolution painting program that can display up to a whopping 512 colors at a time. *Spectrum*'s packed with advanced color editing and anti-aliasing (for smoothing out jagged lines in pictures), features you won't find in any other ST art package. And since it accepts *Degas* and *NEO* pics, *Spectrum* could be used as a touch-up tool for smoothing out jaggies and adding hundreds of colors to existing pictures.

Also coming from Antic is *Cyber Paint*, a paint package specifically intended for enhancing pictures created with *CAD 3D*. Images that would be tough to make in CAD, such as clouds or explosions, can easily be painted in frame by frame using *Cyber Paint* and then resaved still as CAD files. Both *Spectrum 512* and *Cyber Paint* will retail for $60 and are scheduled for release in the first half of October. Contact The Catalog at (415)957-0886 for more information.

I found Data Pacific, maker of the Magic Sac, at the show with a "working" prototype of Interceptor 1, the disk drive interface that will supposedly endow your ST's floppy with the ability to run Macintosh disks right out of the box. Unfortunately, though it was a "working" prototype, Data Pacific decided not to actually demonstrate the Interceptor. Something about it not quite writing to the Mac disks correctly. They say, however, that the interface should be ready in four to six weeks for less than $200. It seems they were telling me that at March's West Coast Computer Fair. Hmmm.

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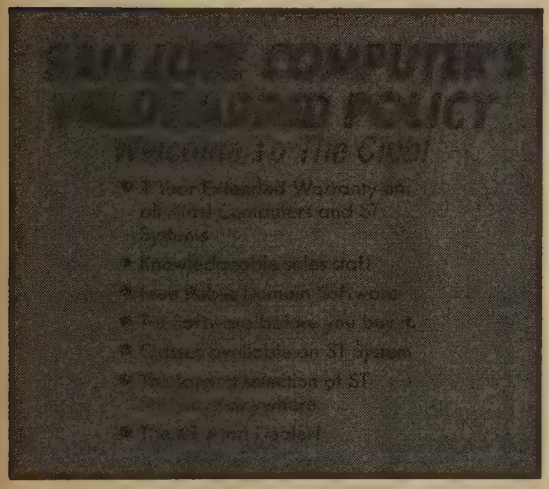

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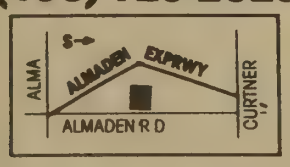

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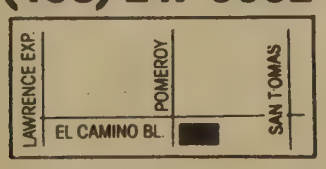

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CP/M Lives ON!
In The Business World

By Robert D. Athey Jr.

We've all been concerned with the disappearance of CP/M computers from the marketplace. Indeed, one of the jokes about the merger of the BAKUP and BAMDUA user groups is that they should make themselves the adoptive parents of the "orphan" computer users. Woody McPheeters, owner of about eight different orphan computers, is a strong proponent of that idea.

Meanwhile, I recently heard of a great resource for people in this predicament—the "Orphan Help Line" BBS (415/753-5581), for users of T-99s and DEC Rainbows, offering public domain programs and tips. Guy Romano has the time, the energy, and the dedication to maintain this service and reputedly has a mailing list of 169,000 users. He's got my admiration, too!

THE ON! SYSTEM

Given the state of the CP/M marketplace, though, what would drive a company to introduce a *new* computer based on the CP/M operating system? The unique ONEAC Corporation has a long term background in specialty electronics fixtures for the technical world (not unlike Non-Linear Systems, parent to Kaypro). ONEAC designed its computer from the area of its own strength—signal conditioning to make sure the electricity coming (or not coming) from the power line does not disturb the function of the sensitive electrical devices connected to the computer.

ONEAC's analysis of the computer industry points to a unique feature of the market for desktop *business* computers. Each of these computers is dedicated to whatever task the person (or small group of persons) is assigned. Usually that assignment has to do with a single function—word processing only, or spreadsheets dedicated to accounting functions only, and so on. Given that single function dedication, the ideal business desktop computer needs a combination of speed and large memory with few programs, and the capability to have instant access with no waiting and continuous electrical power protection.

So ONEAC called on Nick DeWolf (of Silicon Valley fame) to design and develop the ON! computer incorporating all of these features. The computer comes in four parts, with some made by third-party experts for that item. CRT and keyboard are the Televideo 955 system, a "smart" set with a lot of capabilities, including a setting to make the screen go blank after 10/20/30 minutes with no input. ONEAC makes the quad density drive and the CPU, each to stand alone away from the keyboard and CRT for convenience of storage. Indeed, I keep the CPU under the desk completely out of sight, since you don't have to mess with it at all after initial setup. The quad density disk drive sits slightly tilted and off to the side of the desk, acting as a bookend for the documentation that came with the computer. The disk has space in its frame to hold a few of the critical disks you might need to store sensitive data.

The ON! has the "signal conditioning" hardware built into the CPU, and it is reputed to stand up to brownouts and even blackouts. Its design has circuit protection and a mini-battery that kicks in with a "trickle charge" when the power doesn't want to keep the RAM alive. The system is rated to keep the RAM alive for 14 hours after the power loss, so the re-powering will be done by the people needed to fix the loss. (Fourteen hours is a little puzzling. I'd think the 9 to 5 office would like to see 17 hours, in case the power went off at 5:10 and the failure was undetected until the office people came in at 8:59 the next morning.)

I've had two proofs of the survivability of the data on the RAM disk I put together for this review. The first was in a call I made to the ON! Technical Service department, where Bill Elliot told me to *unplug* the thing while I was talking to him. Since I had about half a megabyte of critical data on that RAM disk, I experienced considerable trepidation as I yanked the plug. After I'd told him the screen had gone blank, he said "Plug it in!" and I did—to see that the program I was in when I pulled the plug was back on the screen exactly where I'd left it. I was most pleased.

I received further proof while I was off on vacation—something happened locally to induce modem catatonia. I quickly looked into the ON! files (untouched for two months due to a blown CRT) to find all still among the usable and alive. Small celebration there, too. I'm really impressed.

How about the speed? You bet it is speedy, as the disk I/O is eliminated from the process. I've run *SL MICRO*, a statistical data treatment program, on my Kaypro with very large data sets. It's extremely slow, but it got the job done, and it's all I had. Testing the ON! system, I recently ran a correlation of two data sets (149 items each) with standard deviations and other interesting calculations on each data set—it zipped through the calculation in less than a minute. On a less serious note, the ON! is nominally a 4 MHz device, but the hand/eye coordination games from my Kaypro border on unplayable at the RAM disk speed.

The ON! comes bundled with good software—*NewWord* v.3.17, *SuperCalc* 2 (until they run out of current supplies), and a wide variety of utility programs especially designed for the ON! The operating system is ZRDOS (a modified form of CP/M 2.2) from Echelon Software in Fremont. Among the utilities is *ONED*, a *VDO*-like miniword processor that uses *WordStar*-like commands, and a file manager (reached from a menu) that is very like *NewSweep*. Their modem program was *MDM7*, but is now *IMP2.24*. The ON! people tell me they are putting in a large print buffer program shortly, too.

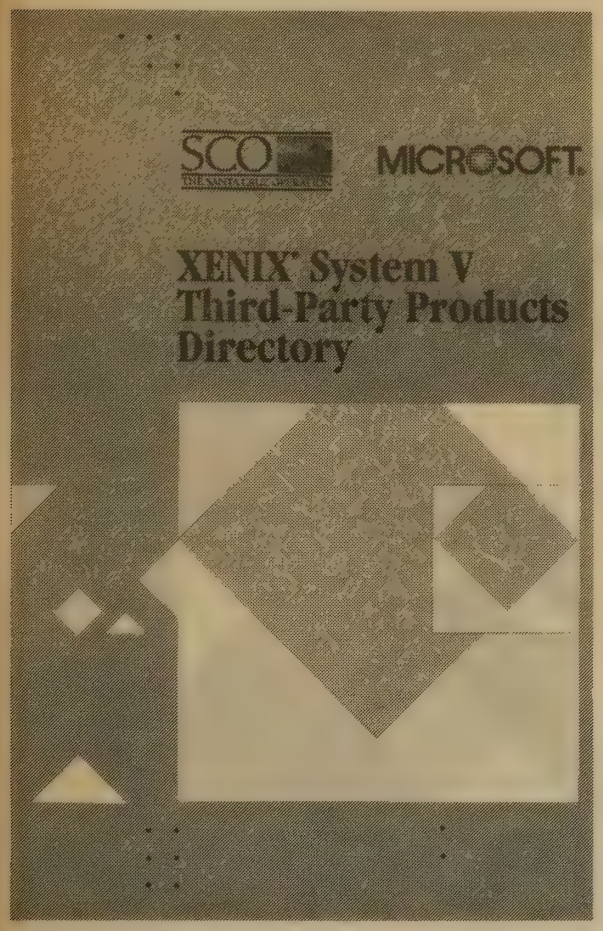
Technical service is a real bugaboo for the novice computerist, and I choose to be the non-techie novice for a lot of reasons (not the least of which is my empathy for the neophyte who's plunked down in front of this strange device and told to go to work!). It turns out the ON! review was substantially aided by the advice and counsel of several technical service people: Luther from the Televideo repair shop, Dave McCord at the Echelon software house, and the ONEAC people (John Carobine and Bill Elliot). The CRT blew one day (sound and signal through to the computer and disk drive, but no picture), and I had it fixed at Televideo down in Mountain View on warranty. When it was returned, it was dumb, and I couldn't get the cursor to move or any communication to the CPU. It turns out that the monitor was set up for testing, and not returned to the configuration needed to communicate.

There are 36 internal settings one needs to have match the computer, and both the ONEAC and the Televideo people I talked to on the phone told me about the configuration situation and where to find the necessary information in the documentation (the ON! doc set presented it better than Televideo's did). Subsequent calls to all the technical service people showed them responsive—even to the point of saying "I'll call you back because this will take some time to talk you through it." I know lots of techie types in software and hardware who have little patience with us stumblers, so I really appreciate it when someone takes the time to give me a hand when I'm lost. (I'll never forget the modem suppliers who told me they weren't supposed to teach me telecommunications. Yeah? Who is?)

The documentation received with the ON! is still in a state of flux, though it will be out in final form shortly. The original set was a pair of incomplete drafts that covered different elements of the software, though their coverage was excellent. The installation procedure was very well spelled out—a much appreciated facet of the package—as we had the system going in a matter of minutes after unpacking. The CRT documentation and the *NewWord* documentation were in final form, and were the excellent constructions you'd expect. Only the *NewWord* documentation was well enough indexed to suit me (for instance, there should be an "error messages" or some such index pointer!).

All in all, I am very pleased with the ON! system. It boils down to the fact that I don't care what operating system it has—it uses good software and uses it fast and well. The ON! does a great job. (The ON! Computer, ON! Systems, Inc. a division of ONEAC Corporation, 27944 N. Bradley Rd., Libertyville, IL 60048, 312/680-4680.)

Bob Athey has over 20 years of experience working on computers and runs his own company on chemical consulting and contact research. He can be reached through MicroTimes or at (415) 526-3541. *Copyright © 1987 by Robert D. Athey Jr. All rights reserved.*

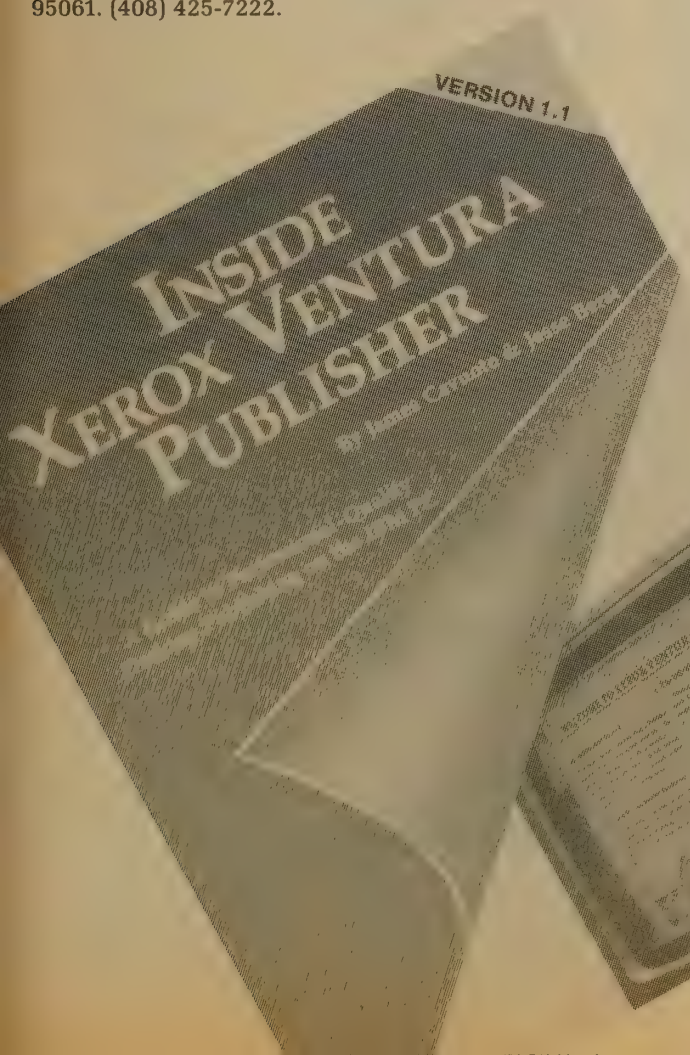


Product Directory For XENIX System V

Xenix System V Third Party Products Directory, from The Santa Cruz Operation (SCO), is a guide to help VARs, OEMs and end users build the XENIX based solutions they require. The directory is organized by category and provides three indexes: Products by Vendor, Products by Category and Alphabetical Product Listing. *Products Directory* is published twice a year in January and July. ($14.95) The Santa Cruz Operation, Inc., 400 Encinal St., P.O. Box 1900, Santa Cruz, CA 95061. (408) 425-7222.

A Resource Guide For Desktop Publishers

Wiley Westerfield's *Desktop Publishing/Teletypesetting* is a guide to the producers of desktop publishing products. It provides descriptions of hardware and software and is fully indexed and coded. Along with a glossary of terminology, it also includes desktop publishing techniques and strategies. The book covers all aspects of production including professional typesetters and telecommunications. ($16.95). Westerfield Enterprises, Inc., P.O. Box 6219, San Diego, CA 92106. (619) 226-3271.



Getting Inside Xerox Ventura Publisher

Inside Xerox Ventura Publisher, by James Cavuoto and Jesse Berst, is a guide to desktop publishing on the IBM PC. The book gives a complete introduction to *Ventura Publisher* and goes on to describe creating text, creating pictures, working with style sheets, document design and layout, and producing output. There is also a chapter on special tips and techniques. A manufacterers and products index is included. ($19.95). Published by Micro Publishing, 21150 Hawthorne Blvd., Suite 104, Torrance, CA 90503.

Build A Demo Or Tutorial With Instant Replay

Instant Replay from Nostradamus is an authoring system for creating demonstrations, tutorials, presentations, prototypes, menus and music. It has the ability to insert prompts, pop-up windows, user involvement, music and more. The package also includes *Screen Genie* which creates screens for programmers and non-programmers. ($149.95). Nostradamus, 3191 South Valley St., Suite 252, Salt Lake City, Utah 84109. (801) 487-9662.

Here Comes The FCC Again Or, Modemers On The Warpath

By Mary Eisenhart

Before we get to this month's happenings out in user group land, a crisis is looming that threatens to have dire effects for all of us who use modems, assuming any of those modem calls go across state lines. You'll hear more about this from the intrepid **Brock Meeks** in his column; meanwhile time is of the essence.

On June 10, the Federal Communications Commission issued a proposal which calls for assessing charges of about $5 per hour for services offered by packet-switched networks, such as those offered by **Telenet** and **Tymnet.** These networks are currently exempt from such charges. The change is scheduled to take effect on January 1, but is required to go through an extensive public comment phase. That means the time has come for the likes of us to speak up. Loudly.

Rather atypically for such matters, this issue is being extensively discussed in print media including the *New York Times* and the *Wall Street Journal*. And needless to say, the nets are abuzz with outrage and argument, from the big nationals like **CompuServe** and **The Source**, which anticipate a considerable increase in costs to their users if the plan takes effect, to regional systems like **The WELL**, where a surprising number of users log on from out of state.

The WELL is, in fact, resounding with howls of outrage. **Brett Glass** and **George Por** have started topics in the telecommunications conference to discuss the issue, eliciting a variety of comments. Says user **Louis Jaffe**, "I managed to run up a $275 Telenet bill doing my daily bit on the WELL — without any $5/hr. access charge. This thing *can't* go through."

Brett and others advocate a vigorous letter-writing campaign (c'mon, put that mailmerge to work...). Says he, "Time to write the FCC again, particularly Chairman **Dennis Patrick**, and be emphatic about what a catastrophe this would be for all of us. The other commissioners are **James Quello, Mimi Dawson** and **Patricia Diaz Dennis** (there is still an unfilled seat vacated by chairman emeritus **Mark Fowler**). Write them all!"

Dave Hughes, operator of Colorado's Chariot board, retired Army colonel, computer populist and scourge of local politicians, retorts, "Letter writing, hell! It's time to deluge the Commissioners with telegrams, the *Wall Street Journal* with letters, Congress with cries of foul, and organize a **Modem March on Washington** so big every TV network carries it for about a week.

"Now let me see. Suppose we get 500 modem users to assemble in front of the FCC building in Washington, DC, after informing the Big Media of course. And then demonstrate, each holding a modem aloft. And with everyone wearing old tattered clothes march round with banners proclaiming something about "STOP MAKING THE INFORMATION POOR," "MODEM ACCESS FOR ALL," "OUR CHILDREN MUST BE ABLE TO LOG ON!" Oh I think we could — with a little imagination — get quite a bit of national attention.

"Come to think of it," he adds, "White House Chief of Staff **Howard Baker**, so long a user of The Source for both tracking his kids in college and linking with his home state of Tennessee as a Congressman that he was in their national advertisements, would probably grasp this issue quicker than anyone. 'Hello FCC Chairman, this is Howard Baker calling. Have you got an e-mail address?'"

Whatever response you'd care to make to all of this, the time to do it is *now*. Write the FCC:

Office of Opinion and Review
The Secretary
1919 M Street NW
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Washington, DC 20554.

Refer to "Interstate Access Charges Exemption for Enhanced Service Providers CC Docket 87-215." According to Brock, copies of this document can be obtained by calling the FCC at (202) 632-7000. Write each of the FCC commissioners individually at the same address. Write your Senator and/or Congressperson.

And if you'd care to check out (or participate in) some of the online discussion of this issue and its theoretical underpinnings, you'll find it on just about any network these days, from USENET to The Source and CompuServe to BIX. If you'd like to access Dave's Chariot system in Colorado, where discussion is *always* lively, dial (303) 632-3391. And this would also be a great time to leap into The WELL (415) 332-6106, where argument rages in Topic 54 of the Telecomm conference and George Por is diligently posting comments he's gleaned from the many nets he frequents in Topic 55.

Clambering down from the editorial soapbox...

Time for News of the Month, short version.

Good news for CP/M users — you have a new resource in **The CP/M Connection**, a BBS in Hayward which runs 24 hours a day at (415) 886-4734. Says sysop **Mike Lipschutz:** "This bulletin board is dedicated to the many computer users with Digital Research operating systems, such as CP/M-80, CP/M-86, Concurrent CP/M, Concurrent DOS and Echelon's ZCPR3. We hope all you CompuPro, Kaypro and Morrow users find The CP/M Connection a useful service in the professional community."

Due to a momentary lapse on somebody's part, we neglected to provide the contact information for the **OSAS User Group** in Southern California. You'll recall that this group is being formed under the auspices of **Micro Computer Consultants** to promote the understanding and use of Open Systems Accounting Software — if this sounds like something you need to know about, call (213) 452-1335.

Macintosh BASIC fans in the Bay Area might want to check out BAMMSBUA, the **Bay Area Mac MS BASIC Users Anonymous. Ted Jones**, our correspondent from BAMMSBUA, characterizes the group as "a high-level users group devoted to the Microsoft dialect of BASIC for the Macintosh." He suggests you call him for more info at (415) 826-9239.

Mark Butler of DACE, the **Diablo Atari Computer Enthusiasts**, writes in with an update on this long-established group, which has recently expanded its by-laws to include support of all Atari computers by such methods as a disk-of-the-month program for both 8-bit and 16-bit Ataris. "Many of our members produce original public domain programs which are seen nowhere else," says Mark.

He adds, "One thing that I think sets DACE apart are the people. Several people have come up to me expressing dissatisfaction with the way some clubs are run. They get the feeling that the clubs are run like a corporation, always money hungry and impersonal. But these same people tell me they get a very good feeling about DACE. We do not have a big budget, but everybody pitches in. I have been president of DACE for six months now, and I am having a blast. DACE is not the biggest group in the area, but I think it is the best." Atarians, check it out. Mark recommends that interested parties call **Big Mike** at (415) 798-6565.

Meanwhile, in scenic Sylmar, **David Nussbaum** reports that the **Consolidated Computer Club** has moved to new quarters. Meetings are now held at the Life Support Association, 13741 Foothill Blvd., Sylmar. (He also seems to suggest that there aren't any meetings till September, so it might be best to check for meeting times and dates. You can write him at 14200 Polk Street #53, Sylmar, CA 91342-2966, or call him at 818/362-9718.

That's about it for now — this column should resume its general format of local happenings next month. But in the meantime, write the FCC...And us, of course. Send e-mail to **microx** on The WELL (415/332-6106) and US Mail to User Group Network, 5951 Canning Street, Oakland, CA 94609. See you next month! □

BULLETIN BOARDS

065

Remote Bulletin Board. (065) 242-7669 (Singapore). 24 hours, N-8-1, 300/1200/2400, UL/DL 67 meg. Sysop: Umar A. Rahman.

206

The Board Of Review. (206) 361-8018. 300/1200 baud, 8-N-1, 24-hours, Commodore. Sysop: Ron Strauss. .

28 Barbary Lane. (206) 323-2828. 300/1200 baud, 8 bits, 1 Stop Bit, Full Duplex, No Parity, 24-hours. Sysop: Mrs. Madrigal.

209

Region 7 TEC Center BBS. (209) 571-5085. Specializing in music and schools. 24 hrs, 300 baud. Sysop: Dan Guerra.

Inn Finity BBS. (209) 521-6240. Inn Finity is an Atari based BBS. Operates on a 130XE with 320K. Signalman 300/1200/2400 baud, 24 hours a day. ATASCII—ASCII. Sysops Buzz and Jann Kelley.

Bullseye BBS. Stockton, CA. (209) 474-FIDO. IBM and compatibles. 300/1200/2400 baud. Open 24 hours, 8-N-1, FidoNet 161/31 Valley PCUG. Sysop: Bob Loeber. Validation required. Lots of MS-DOS shareware.

The Spotlight BBS. (209) 368-5591. 300 baud, 24 hours, 8-N-1, dual drive Commodore 64 operated. Sysop: The Spot.

Bertha Board. (209) 239-9853. 8-N-1, 300/1200/2400 baud. 24 hours. MS-DOS oriented, with emphasis on programming source code. Free. Sysop: Ken Roach.

Motherload-64 BBS. (209) 754-5530. 8-bit, 1 stop, Punter and X-Modem, D-load, 9:30pm to 6:30am only! 300 baud. Motherload-64 is run by a programmer who is also a

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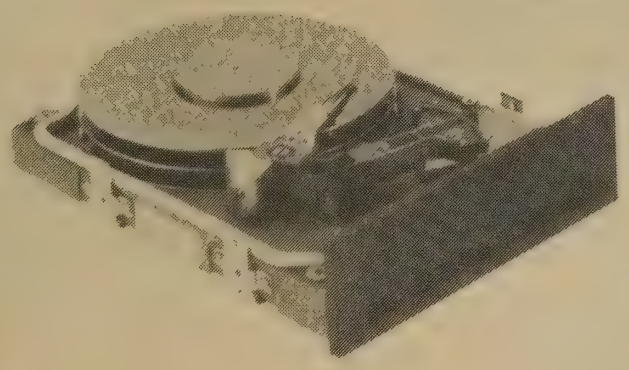

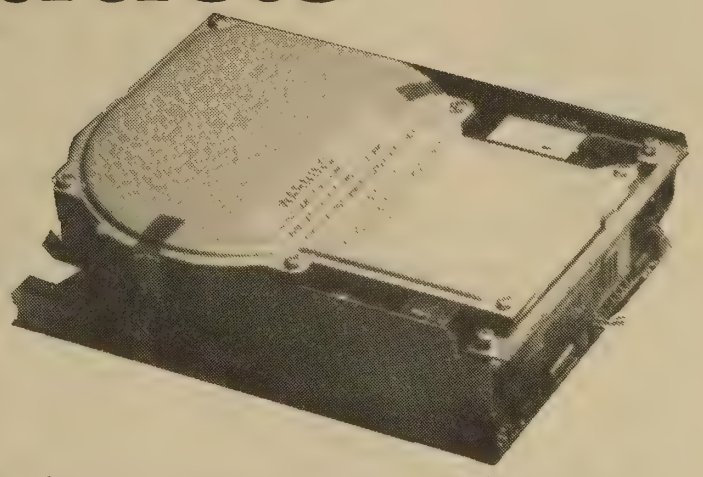

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213

Lynzie's Motherboard (818) 508-6482/(213) 650-0519. 24 hours, 300/1200/2400 baud, 8-N-1. Private E-mail, download library, dating matchup, interactive chat between users, 4 phone lines on rotary. Public boards include employment, food and restaurant reviews, sci-fi, political, debate, for sale and many more. Monthly social happenings for local users. Sysop: Lynzie Flynn.

Bulletin Board System. BBS devoted to handicappers and racing fans in So. Cal. On line every weekend. Log-on: race data for Santa Anita, Hollywood Park and Del Mar. (213) 934-6026.

Videodrome BBS. Where computers and video meet. (213) 324-5882. Open weekdays 4 pm - 2 am, weekends 12 pm - 2 am. A Commodore 64 system.

HUG1. The official BBS of the Hollywood Commodore User Group (HUG). All HUG members and visitors are welcome to drop by. (213) 874-8256.

The Wargames RBBS. Call for one of the best IBM RBBS around, running with the latest merge for RBBS-PC. Win free time weekly with secret password. Features include the latest PC news, special news reports, BBS listing, messages, e-mail, downloading/uploading, color/music online. Best of all, it's FREE! Operating 24 hours a day at 2400/1200 baud. NO 300 BAUD ALLOWED! Sysop: Jason Lin (213) 393-9777.

International Collectors Network. Coins, stamps, baseball cards, books, records, antiques and anything collectable can be bought, sold, or traded on the International Collectors Network BBS. Regional lists of collector events and shows in many categories. Also names and addresses of many collector organizations. Accessible using PC Pursuit. Data phone available 24 hours, 7 days at 300/450/1200/2400, 8, N,1. (213) 204-0646.

The Computer Consultant's Network, (213) 479-4074. Running a modified version of Martian! Software. 24 hours a day. This is not a job board, but merely a place for computer professionals to network and share information.

Computer Conference Center. (213) 212-5267. TBBS w. Commodore, IBM, TI, Atari, Epson, Apple etc. sub-boards. Large DL with CP/M, MS-DOS and TR-DOS programs. Laurie Flood, sysop.

Hughes Aircraft Message Service. Uploads and downloads for Mac, IBM, Commodore, Atari, etc. Public message boards. (213) 549-9640. 300/1200, 24 hrs., 7 days.

Monolith-1.7 great public boards, private electronic mail, social events. (213) 659-JEDI. 24 hours, 1200/300. Sysop: Erik Goldman.

Mid-Cities Atari ST BBS. 300/1200, 8-0-1, 24 hours. (213) 867-1943. Sysop: Darin Ferraro.

PC Heaven. A multi-computer BBS that features downloads for many different PCs. E-mail, files for various machines, general to SIG message bases. No fees, no special application request forms. Just a fun BBS for everyone. (213) 374-7929. 300/1200, 7 pm-7am M-T, 24 hrs. F-S-S. Sysop: Tony Reeves.

Tele-Web. (213) 372-4050. 300/1200, 7-1-N, 24 hours, multi-user. **MicroTimes Electronic:** Southern California edition of *MicroTimes*. Articles, events calendar, BBS and user Group listings for Southern California, classifieds. Type GO MICRO. **Home Loan BBS:** Up-to-date home mortgage rates supplied to you by Pacific Mortgage Group, a company that prides itself in getting you low mortgage rates. Rates are updated weekly. Type GO LOAN. **Dining-Line:** South Bay database of online restaurant menus. Menus may be searched by type of cuisine, price of a meal, name of restaurant, etc. Database includes complete menus and a community forum. Type GO FOOD. **LA Weekly Electronic:** electronic version of LA's largest weekly entertainment newspaper. Includes feature articles, calendar and events listings, classifieds and more. A new edition each week. Type GO WEEKLY. **Easy Reader Electronic:** electronic edition of the Easy Reader newspaper. Includes feature articles, weekly calendar, night club listings and classifieds in over 80 categories. Type GO EASY. FREE.

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Jukebox Bulletin Board (JBBS) (213) 670-8053. 8-N-1, 24 hours, 7 days, 300/1200 baud. Message board for buyers, sellers, and anyone interested in antique jukeboxes. Free. CP/M password available on request. No Fees. sysop: Ray Etchepare.

Secret Partner 1. (213) 543-5273. 8-N-1, 24 hour, 300/1200 baud. "Find your long-awaited sweetheart." Walter F. Howard, sysop.

Time-X-Change. (213) 329-3922. 8-N-1, 300/1200 baud, 24 hours. The West's only BBS dedicated entirely to the Timex-Sinclair user. Online games and information programs, full feature electronic mail and message system, public domain software. Free. Sysop: Dave Clifford.

Videoman RCP/M and Media Man Database. (213) 666-8588, 300/1200 baud. Hollywood's only remote computer for the show business and entertainment community. Free comprehensive databases, including hard-to-find products and services (US and Canada), television/motion picture production /post production services (worldwide), Los Angeles restaurant guide, remote access computers (world-wide), People In Entertainment and many more. CP/M, MS-DOS pd programs. 40 megabytes and growing. 7 days, 24 hours. Sysop: Norman H. Strassner.

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The Starship Sardonyx Net. (213) 467-6667. 8-N-1, 300/1200, 24 hours. We offer extensive general files, online games, up and download subs, 8 message bases, e-mail. Large public domain section for Commodore users. Sysop: Zed Yago.

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Alinco Ind. RBBS. (213) 402-4716. 300/1200/2400 baud, N-8-1. Upload and download of public domain files. E-Mail, conferences: games, communication and technical references, systems and peripherals price list. This is a totally new board. Sysop: Albert Chang.

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312

Feminist BBS. (312) 225-9138. 8-N-1, 24 hours, 300/1200 baud. Feminism, women's issues, general talk. Sysop: Susan B. Anthony.

408

Atari Base BBS (408) 745-5308 or (408) 745-2642. 300/1200 baud, any time, any day. The official BBS of Atari Corp, for all Atari computers.

Byte Bandits ColossusNet. (408) 374-3974, 300/1200, 24 hours. Network USA. Sysop Sam C. Brown.

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Home Board (408) 277-0106 no fee. A non-profit BBS focused on housing issues in Santa Clara County. 1200 baud, 24 hours M-F (8 am Monday through 5 pm Friday). Sysop: Charlie Chew.

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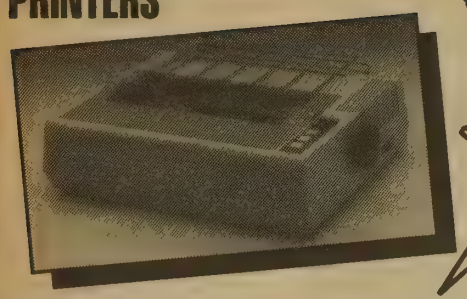

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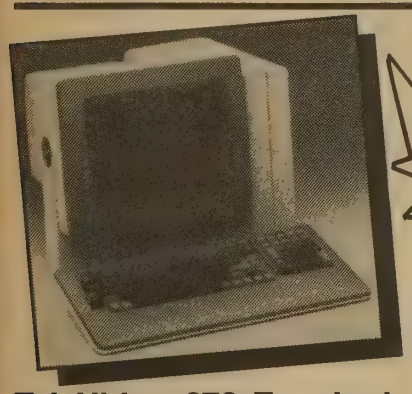

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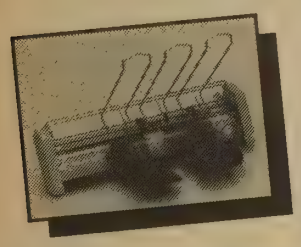

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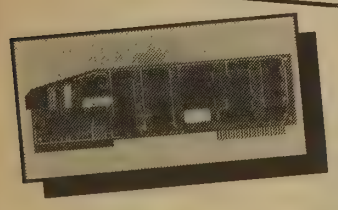

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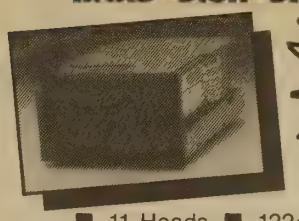

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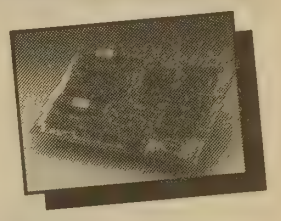

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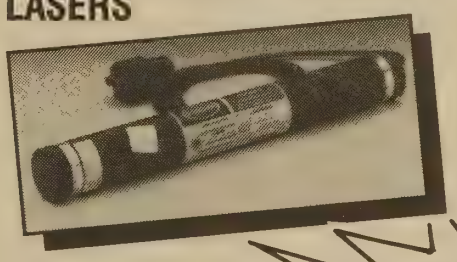

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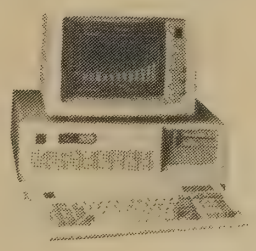

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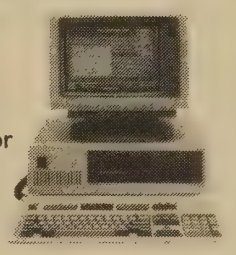

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channels, games with others. Mail and bulletin boards, of course. Not free, but cheap. 24 hours, 300/1200, (415) 527-4510. **POPnet San Ramon** is 10 lines of fun and games. Chat, CB channels, games with others. (415) 830-1191. **POPnet Walnut Creek** is 19 lines of fun and games. Chat, CB channels, games with others. (415) 932-4263.

Vaudeville Local. (415) 337-8693. 24 hours, 8-N-1, 300/1200. Vaudeville Local is a BBS dedicated to vaudeville and circus arts. Sysop: Arthur Conway.

Crossroads BBS. (415) 968-9341. 300/1200 baud, 8 bits, no parity. 24 hour operation. File transfer for IBM/compatibles, Commodore 64. Message bases include space travel, singles, political dissent, sexual freedom, stories, poetry, musician's referral, programmer's corner, adventure gaming. No fee. Mike Macgirvin, sysop.

LaserWriter BBS. (415) 261-4813. 300/1200 baud, 24 hours. BBS dedicated to desktop publishing. Sysop answers all related questions. Located within Allen Computer Graphics, desktop publishing specialists. Files, messaging, user groups, e-mail. Upload direct for LaserWriter printout or to order other products offered by Allen Computer Graphics. Macintosh and other computers welcome. Sysop: Tom Allen.

The Records Department. (415) 426-0470. User registration required. Public domain and shareware programs available for download at 300/1200/2400 baud. Caters to IBM; also Apple, Commodore, Atari. Large, friendly discussion section with something for everybody; games, voting booth, technical help. Bill McCauley, sysop.

Silicon Valley Computer Society BBS. (415) 968-6891, 300/1200, 24 hours. Sysop: Herb Shear.

Computer Adventure Center, C.A.C. 24 hours daily, 300-2400 baud, in Fremont. No fees, IBM based but open to all callers. New BBS#: (415) 490-7365. Sysop: Al Demar.

Breakthrough Software BBS. Support for TimeLine users. (415) 892-0408, 300/1200/2400 baud, 8-N-1. XMODEM or Kermit protocols. 7 days, 24 hours.

EBMUG BBS. Running 24 hours a day, 300/1200, 8-N-1 at (415) 848-2609. Private mail system, public messages, Macintosh software.

KAY+FUN RCP/M. (415) 572-8219. MS-DOS, CP/M, modems, business applications (e.g. *dBASE, Lotus, Reflex*, Wordproc). General discussion of commercial and public domain software. Also public domain and private file transfers and more. FREE online registration. 300/1200/2400. Sysop: Ernest Hintz. Sponsored by KAYFUN users group.

Programmer's Circle. (415) 239-1722. 8-N-1, 300/1200, weekdays 3 pm-11pm. The Programmer's Circle specializes in carrying source code and tools to aid the programmer. Special attention is given to the Macintosh and Apple II computers, but all computer users are welcomed. Data files are online for the Mac and Apple II computers. Sysop: Roger Gibby.

The Live Wire. (415) 540-0529. 300/1200, 24 hours. A digital magazine for the graphic-arts community (printers, typesetters, self-publishers, artists). Free. Sysop: Rick Hepting.

SIGSIG BBS/RCP (formerly MEBBS) is back online! Member of the FOG and PRACSA networks. Supporting CP/M and MS-DOS public domain software and a public-access message system. No fees, novices welcome. Online registration for FOG, PICONET and PRACSA members. 24 hours, 300/1200/2400 baud. Sysop: Jim Switz. Located in Mountain View. (415) 968-7369. Call today!

Cold Moon On A Single Star. (415) 668-6101, San Francisco. 24 hours, Fido board. Chinese culture, history, language, Chinese cooking, discussion, etc. Asian community events. Sysops: Joseph Puig and Susan Chen.

Dr. Don's TBBS. (415) 885-1973, San Francisco. 300/1200, 24 hours. CarTalk and SportsTalk discussion and special interest boards. Private e-mail. All automobile sportscar enthusiasts, sports fans, softball-baseball-football players are invited to call. Sysop: Dr. Don. Co-sysop: Bimmer Pilot.

Centerville RBBS. (415) 793-3037. 300/1200/2400 baud, E-7-1 or N-8-1, 24 hours daily. Sysop: Joe Halbleib.

The Board. (415) 652-8277. 1200/2400 baud, 8-N-1, 24 hours. Public and private conferences, technical support. For AT&T and compatibles; AT&T PC support conferences. Associated with Bay Area AT&T PC6300 Users' Group. Sysop: Troy Blackburn.

Attitude Adjustment. (415) 939-1639. 8/N/1, 24 hours, 7 days, 300 baud. Call today and get your Attitude adjusted. . .just for fun. If you have an Attitude and want to tell people about it, you know where to call. Small but growing system: 8 message bases, private e-mail, voting, textfiles and a few downloads. Emphasis is on interaction between Adjusters on the message bases. Sysop: Rick Adjuster.

Dial-Your-Match #341 in Hayward. (415) 489-2572. 24 hours, 7 days, 300/1200 baud, no charge. Sysop: The Matchmaker.

Yet Another BBS. (415) 689-8952. 8-N-1, 300/1200, 24 hours, 7 days. Upload/download, entire public domain library of "The Ulternate Source." All makes of software, message base, e-mail. Friendly sysops! Jim and Alex Stewart.

Track 3 BBS. (415) 752-6172, 300/1200/2400 baud, 24 hours, 7 days, San Francisco. For railfans, roller coaster enthusiasts, model enthusiasts and the like. Fido 161/201. Sysop: Robert Parks.

Infolinc RBBS. (415) 672-9270. 8-N-1, 300/1200/2400 baud, over 500 files online, conferences, doors, online chat with other users. Special private line for supporting users, running PC Board 11/6/E, 24 hrs. Sysop: John Palmer.

DYM #56. (415) 964-3255. 8-N-1. 24 hours, 300 baud. Features user match function and e-mail, five message boards including Public, User Activities, The Flea Market (Buy/Sell/Trade) and two Adults Only boards. No fee required, but online registration is required. Sysop: Velvet 150.

Palladin BBS. (415) 332-1655. 1200 baud, 8-N-1, 7 days, 24 hours. Sysop: Al Kalian.

The DeskTop Publisher. (415) 856-2771. 300/1200/2400 baud, 24 hours, 7 days. Dedicated to desktop publishing, with particular emphasis on the use of DOS based hardware and software. Upload / download / messages/conferences. Anyone interested welcome. No fee. Registration required for full participation. Sysop: Freeman Bradford.

The Nimitz DownPort. (415) 276-3677. 8-N-1, 24 hours, 7 days, 300/1200 baud. The Nimitz DownPort offers a wide variety of message bases including Adult. With a BBS that has parties, educational offerings, discussions with nationally- and locally-known "geniuses" and experts, and "hands-on" role-playing games, there is no reason not to dock here. Call today and be a part of tomorrow. Sysops: Lady Godiva and Portmaster Kevin Munrow.

Marin-Sonoma PC Users Group BBS. (415) 927-1216. 300/1200 baud, 8-N-1. Sysop: Howard Leistner.

California ConneXion Partyline. (415) 927-2739. 8-N-1, 300/1200/2400, 24 hours. Member of BayOps. An adult oriented multi-user, multi-interest system featuring matchmaking, 20+ public message boards, on-line chat with other users, questionnaires upload/download library, pictures, private E-Mail and more! Extremely fast system running on an IBM/AT at 9.5 mhz with 70 megs of storage and 9 lines on a rotary. Registration required! Sysop: Alan.

Impeesa's Path. (415) 582-4863. 1200/2400, 8-N-1, 24 hours. Focused on outdoor activities. Conferences on camping, hiking, fishing and hunting, photography, Boy Scout activities. Also features "Doors," supports graphics. Sysop: Ed Reardon.

The Wizard Net. (415) 481-8413 San Leandro; (415) 232-6981 San Pablo. Full duplex, 1 stop bit, no parity, 6 am-6pm M-F, 24 hours weekends, 300/1200 baud. A user friendly system that utilizes Commodore color graphics. The more time that you put into the system the more you will be able to get out of it. System has bulletin boards, e-mail, voting booth, a chat feature, ul/dl, and online games. There are no fees, and everyone is welcome. Registration required. Sysops: Dave Rasmussen, Keith Parrish, Olivia Parrish.

AI-NET. Public OPUS board with 20 MB of files. Echo newsgroups for dBASE, Technical Forum, Mainframe Forum, Software Evaluation, Buy/Sell, National Mail, and more. Available between 3 am and 11:30 pm daily. 300/1200 settings: 8-N-1. 125/125 in the Matrix. (415) 776-6628.

SFPCjr UG BBS. Sponsored by the SF PCjr User Group. 1200 baud, 8-N-1, 24 hours. Sysop: Larry Buoncristiani.

RSVP BBS. (415) 659-9169, 24 hours. Japan mail exchange, Doctor Who, Ohlone Forum, Amiga Music-net and Tech-net. IBM/Amiga/Atari files. Always something new! Sysop: Jim Thomas.

tsunami bbs. (415) RAM-2-RAM. Graphics specialty board for most microcomputers. Supports wider interchange of graphics files between "incompatible" systems. U/L's and D/L's for graphics programs and picture files. Collects and distributes p-d graphic format conversion programs, as well as picture files in Microillustrator-compatible, IFF and CocoMax formats. 300/1200 baud, 8/N/1, 24 hours.

Trading Post BBS. Information Exchange system, (415) 948-4163. Open system with more than 20 discussion groups covering everything from Atari to ZCPR3. Online games and 200+ articles. Free. Sysop: Lars Rosengreen, a.k.a. Eskimo.

SPACE-The Stanford Palo Alto Computer Exchange. A BBS for PC professionals and power users. Validation required. (415) 964-9309, multi-node, 2400/1200 baud, N/8/1, 24 hours. Sysop: Jay Fox.

Production World On-Line. (415) 571-6160, 300/1200/2400 baudd, 24-hours. An additional service from **Production World On-Paper**, a printed publication for the motion picture film, broadcast television, video and audio communities featuring Northern California people and facilities. A variety of information and message bases available. Sysop: Wes Dorman.

Amiga Addicts Anonymous BBS. (415) 283-5469 "BUDLINX." 24-hours, Xmodem, 300/1200 baud, N/8/1. Sysop: Randy Spencer.

Aardwolf Express Family Forum. (415) 651-4147. 24 hours a day, 7 days a week. 300/1200/2400 baud. Located in Fremont CA. System offers: *Infomat*, an electronic computer magazine; Showcase, shareware and demonstration programs download; complete King James Version of Bible online; Discovery (Christianity); Friends (user profiles and interests) and user opinion polls. Sysop: Veit Anton Johnson.

The Guardian. (415) 644-6806. The Berkeley Police Department's public relations and community service bulletin board. Lists crime prevention information including neighborhood and business watches, crime statistics and recent press releases. Community organizations are encouraged to call and post events. Everyone invited, you need not be a Berkeley citizen. 24-hours, 7 days a week, 300/1200 baud. Sysop: Officer Carl Orsi.

Commodore Connection BBS. (415) 458-1005. 1 stop bit, no parity, 7 or 8 bit word, 300/1200 baud, 24-hours. Sysop: Clint Beers.

AsKKey XPress BBS. (415) 657-1728. AE Line, 300/1200 baud, 8-N-1, 24 hours, 20 meg system, private E-Mail, several sub-boards, online games. Apple II downloads. No Fee.

S.F. Tea Room. (415) 993-5410. 300/1200/2400 baud, 24 hours. Match Function, IBM Software (3 sections), Macintosh Software (12 sections). Sexually oriented. Sysops: Steve and Ken.

Horseracing BBS. (415) 941-1931. 24 hours, 300/1200 baud, 8-N-1, FIDO.BBS Files open to all. For gamblers, horseplayers, statisticians. Everyone welcome. Using dBASE 3 file structure. All files checked before downloading. Co-op racing database. Free.

Foothill College/Physical Sciences And Engineering Technology (FHC-PSET) RBBS. (415) 941-5725. 8-N-1, 300/1200 baud, 24 hours (8 am Monday through 12 pm Friday). Educational programs offered by Foothill College Information. Files available for IBM and compatibles. Everyone welcome. Sysop: Long Tran.

The Midnight BBS. (415) 752-6172. 300/1200/2400, 8-N-1, 24 hours, 7 days. San Francisco's film center! We have over ten message bases with discussions on the world of cinema. Topics include movies in general, Star Wars / Star Trek, Reviews, Fan Mail and more! Also the new home of Track 3 BBS. We need new users, so call today!!! Free. Sysop: Melt Cober. Co-Sysop: Robert Parks.

Timex/Sinclair 2068. (415) 681-3245. 7-bits, Even parity, full duplex, 300 baud. Free, 7:45 am to 4:30 pm. Sysop: Kevin.

Boot To The Head BBS. (415) 352-5411. 24 hours, 2400 baud. IBM downloads. Message bases. PYROTO Mountain and Trade Wars. Multi-player on-line games and much more. Sysop: Bill Massey.

Video Vision BBS. (415) 366-6409. 300/1200 baud. 8-N-1, 9:00pm to 7:00 pm Monday through Friday. 24 hours on weekends and holidays. Free registration with unlimited download. Just don't crash the system! A color bulletin board system that runs on XT turbo using Wildcat system. BBS include instant access, downloading, uploading, e-mail, on-line program, classified ads. This BBS is mainly for graphics or art, games and utility only. Extremely fast operation on 32 meg hard disk. Prospective user must read bulletin 1 or download "POLICY.TXT" and "FILELIST.ARC." Everyone is welcome. Sysop: Roel Sarceno

The CP/M Connection. (415) 866-4734. 300/1200 baud, 24 hours. This bulletin board is dedicated to the many computer users with Digital Research operating systems, such as CP/M-80, CP/M-86, Concurrent CP/M, Concurrent DOS and Echelon's ZCPR3. We hope all you CompuPro, Kaypro and Morrow users find "The CP/M Connection" a useful service in the professional community. Sysop: Mike Lipschutz.

BAHUG Bay area Heath/Zenith Users Group. (415) 365-7836. 8-N-1, Full duplex operation, 300/1200 baud, 24 hours. Supports programs in CP/M, ZDOS, MS-DOS and PC-DOS. Sysop: Ed Hayes.

619

Ramona BBS. (619) 789-6235. 24 hours, 300/1200 baud, C128, C64, Amiga, Atari, IBM, CP/M. P.O. Box 373, Ramona, CA 92065. Sysop: Digiteer.

Sysware BBS. 24 hours, 300/1200 baud, (619) 278-8661. Commodore machines only. Sysop: Don Malette.

The Nassau XPress. (619) 433-XPRS. 8-N-1, 300 baud, 24 hours. An information and entertainment BBS with 11 message bases including electronics, amateur radio, computer news, music, adventure games, BBS review. Full access is granted to long distance callers with same day validation for new users. UL/DL available using XModem or Punter. Private e-mail, text files, online games and utilities. Sysop: Dan Wright.

Willy-Net. (619) 535-0816. 300/1200, 8/N/1, Large download and message area. IBM. Sysop: Willy Bergner.

702

Public Domain Software Interest Group. (702) 794-3665. 24 hours, 300/1200/2400 baud, 8-N-1. Public domain software available for downloading, message board, and user supported donations of software. Sysop: T. Heisserman.

707

Napa Valley RBBS / RCP / M (707) 257-6502. Interests in Atari, Apple, Osborne, dBase II.

Survival Communication Forum. Fido 125/7. Focusing on preparedness and self-sufficiency. Multiple message and file areas. A MedNet member system featuring weekly CDC reports, medical text and news files. Open to all. 23 hours daily, 300/1200 (707) 545-0746. Don C. Kulha, Sysop.

R.A.G. (Redwood Atari Group) BBS. 300/1200, 24 hrs. (707) 539-8889. Sysop: Bill Marlin.

STATE BBS ST and 8 bit Atari. Supports all Atari computers. On line surveys, public domain software, discussion and a built in adventure game (if you can find it). 300/1200 baud, 24 hours a day, full duplex. Sysop: Mikkel Lawrence. (707) 585-2194.

UNIBLAB BBS. (707) 422-1669, 8-N-1, 24 hrs. 300/1200 baud. Community-oriented BBS. On-line games, SIGs, XMODEM protocol, no fee. Sysop: Ben Harris.

Sigma BBS. (707) 274-8581. Call this BBS for the best IBM-PC/compatible RBBS in the Redwood Empire. Over 650 downloadable programs. We feature "Doors" software for your adventure playing moods and Tradewars II, a multi-player galactic challenge. We also support the latest in RBBS-PC Bulletin Board Software, Communications Software, with utilities and many other programs. 24 hours, 300/1200/2400, 8-N-1. Sysop: Randy Sun.

Valley of the Moon BBS. (707) 996-7922. 24 hours, 7 days. 300 baud. Free. Primarily set up for Radio Shack and COCO II, but all are welcome. Come join us. Sysop: Wes Ford.

Newsstand. (707) 539-3612. 300/1200 baud, 24-hours. Discussions on philosophy, politics and other topics. No Fee. Sysop: Bryan Magers.

Decor Computer Consultants BBS. (707) 746-5820. 8-N-1, 24 hours, 7 days, 300/1200/2400. Primarily for IBM and compatibles running Wildcat! BBS software. Free advice on comptuer related questions. Consulting available on request. No fee necessary to log on. Sysop: Derek Koopowitz.

714

The Consultant's Exchange BBS Serving professional computer consultants and students since 1983 with the finest public domain software for the IBM-PC. Featuring consultants list and job list. (714) 842-6348 24 hours.

Computer Consultant's Network problems, solutions for business,legal and engineering problems. Referral service. (714) 982-5994 intro file.

Environet. (714) 731-6439, 300/1200, no parity, 8 bits, 1 stop bit. David Salahi, sysop. The online source of information and contacts for the environmental community. To log on, use user id 105, password PARKS.

El Toro RBBS/RCPM. (714) 855-0672. 24 hrs. 7 days/week. 300 / 1200 / 2400 baud. No charge, open access, no registration. Specialize in ZCPR3 and CP/M PD utilities. Sections for AMPRO, SB180, dBase II, TPascal, Modula-2, Wordstar, ZCPR3, modems, SIGM and utilities. Over 3000 programs in 88 megabytes online. Public E-mail system. Easy to use ROS system. The collection point for Modula-2 in So. Calif.

K-WEST. (714) 646-3060. 8-N-1, CP/M and DOS. 24 hours, 300/1200/2400. Sysop: Peggy Lloyd.

The Byte Zone BBS. 7 days, 24 hours, 300/1200 baud. Serves all Tandy computers and many others, including MS-DOS. Features adventure help files, electronic mail, message bases and download menu. Sysop: Franco Collino. (714) 639-3566.

CMC Computer Systems. (714) 835-0910. Information boards: Apple II, Apple III, Laser 128, IBM, Buy/Sell, hard disks. 300/1200 baud, 24 hours. Sysop: Charles F. McConathy.

Amiga-Line. (714) 772-4097. 24 hours, 300/1200 baud. 100% Amiga for Orange County. Sections for graphics, sound, BASIC, ROM kernel, C, Hardware and Games. Sysop: Tom Jacobsen.

Diamond Bar BBS. (714) 861-7268. 8-0-1, full duplex. 24 hours, 365 days. Sysop: Albert E. Ray, Ph.D.

The WOCCUG Board. Operated by West Orange County Commodore User Group. EBBS, 8-N-1, 24 hrs, 300/1200. (714) 772-4182. Sysop: Mark Stanford.

The Buckeye BBS. (714) 821-0589. C64, Punter, Xmodem, 300/1200 baud, 24 hours. Sysop: Art Collins.

FBBS. (714) 823-3673. 24 hrs., 300/1200 baud, full duplex. 50 megabyte system based in Fontana. Downloads for Commodore, Amiga, IBM, Atari, Apple, CP/M. 17 active message bases, weekly online magazine. Sysop: Larry Krzewinski.

GameNet. (714) 520-4263, 24 hours, 300 baud, multiuser board. This Orange County based system features interactive games, a chat area, and an online mail section. Sysop: Merlin or Patches.

Bits and Pieces Times BPT-#. (714) 630-5619. 300/1200, No parity, full duplex. 9 pm-9 am. Sysop: John Callaci; sub Mike Dalton.

Software Exchange. (714) 552-3515. 300/1200/2400, 24 hours, 7 days, 8-N-1. Specializing in public domain and shareware for IBM and compatibles. Over 2000 programs in 42 megabytes on line. Features include private and public message bases, conferences and online help and menu screens. Beta Tester for "Wildcat," the next generation of BBS software. Sysop: John Coon.

C-TUG BBS. (714) 458-1288. Punter protocol, 24 hours, 300/1200 baud. Sysop: Les Gertz.

77-Amiga. (714) 77-AMIGA. 300/1200 baud, 24 hours, 40 meg. drive. Sysop: Al Cheser.

French Connection. (714) 858-8111. 300/1200/2400/9600 baud. Ten multi-line BBS in Orange County. Dating service, 500 megs of software for users. Sysop: Stephan M. Cohen.

The Pleasure Connection. (714) 773-5326. DYM 502 Buena Park CA. 300/1200 Baud, 24 hours. Computer dating, open forums, adult boards, etc. Sysop: Russ.

Tripwire Wildcat. (714) 964-1146. 8-N-1, 300/1200/2400 baud, 24 hours. New BBS. Tripwire BBS is providing both public and private telecommunications to users on a WILDCAT BBS system. The latest in PD software is provided in nineteen different file sections. After 75 days of operations the board is providing over 750 files to users and continues to grow daily through active support. Sysop: William Kidd.

Nebula 6 BBS. (714) 595-4020. 300/1200 baud, 20 megs. Online full of download material for Apple, IBM, Atari, Tandy and Amiga. There is a vast amount of space for Commodore files. The bessage bases, text files and online games are extremely popular. Monthly giveaways take place dealing with game winners of trivia, etc. If you would like

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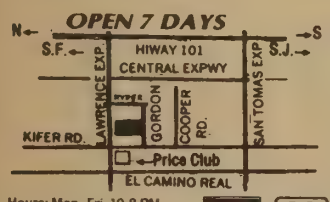

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Q. QUESTION

"Is there a modem available that will allow me to switch between data and voice without losing carrier? If so, are there any problems that I should anticipate?"**

MANY sales outlets are not technically qualified to answer questions like this because they are in business basically to move "iron" cheaply.

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A. ANSWER

For a modem with external voice/data switching, **ARCOM** suggests the *Avatex™ 1200hc* (Bell 103, 212A) at $139 or the *Avatex™ 2400* (Bell 103, 212A/CCITT V.22, V.22bis) at $249. Both modems are Hayes AT command/option set compatible.

Or, incorporate the *Avatex™ 1200i* in your IBM expansion slot for $99. It is Bell 103, 212A/CCITT V.21, V.22 (selectable), and Hayes AT command/option set compatible.

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F&W Guns. (714) 653-0494. 300/1200. 8-N-1. Sysop: Louis Ringe.

The Circuit Board. (714) 778-0948. 300/1200/2400, 8-N-1, 24 hours. IBM-PC software. 106 MB disk space. Sysop: Dave Kleinschmidt.

717

The Dead Board (717) 677-9573, 24 hrs., 8 bit word, 1 stop bit, no parity, 300/1200 baud. Grateful Dead tape trading and info; space for bulletins, ads and public mail.

805

Thousand Oaks Technical (805) 493-1495. This massive 64 megabyte board has a mind-boggling number of downloadable programs. The board has no bulletin board feature and allows unlimited upload time. Download time is limited depending on upload exchange.

KERNCOM. (805) 322-8800. 300/1200/2400 baud, 24 hours, 7 days. KERNCOM has operated continuously since March 1983 for the IBM community. KERNCOM is owned by the Kern Independent PC Users Group and is never off line except for routine maintenance. Sysops: Rick Heming and Jim Harrer.

CCCUG BBS. Central Coast Commodore Users Group. (805) 934-2216. 24 hrs/7 days, 300 baud, Punter BBS protocol for downloads. Sysop: Greg Johnson.

PC Vision. (805) 487-3149. 300/1200, 8-N-1, 40 megs. PC-, MS-DOS programs. Sysop: Frank Driscoll.

Tech-Talk. (805) 922-5488. 300/2400 baud, 24 hrs. 21 meg pd software on a 63 meg system. Online registration, instant access to all files, MS/PC-DOS, CP/M. Sysop: Jerry D. Russell. Public access "Collie ver. 1.2."

CompuLink Fido. (805) 494-3350, 300/1200/2400 baud, 24 ours except during netmail. Huge selection of ham radio files; other features include echomail, Outside, and role-playing games (StarTrek, Gamma World, Champions, AD&D, more!!). 20 megs—call today! Sysop: Eric Daymo.

Mustang WILDCAT! BBS. (805) 396-0650. Bakersfield, CA 300/1200/2400/9600 baud. 24 hours, 7 days. This board serves as the development home for the WILDCAT! Bulletin Board System written for the IBM PC. Free access to over 40 megs of download files on your first call. The message section supports conferences in Turbo Pascal, PC Utilities, WILDCAT! updates, electronic stock reports, and many others. Sysops: Jim Harrer and Rick Heming.

Affection Connection. (805) 527-7464, (818) 704-8588. 24 hrs., 7 days, 300/1200 baud. Multi-user BBS offering live on-line chatting, matchmaking. Sysop: Devin Woods.

Success BBS. (805) 238-7359. 300 baud, 24 hours. Commodore user group. Sysop: Larry Sarver.

813

Blithe Manor. (813) 839-0734. 1200 baud, 8-N-1, 24 hours. Multi line. Adult dating. Sysop: Bill Rucker.

818

Granada Engineering Group RCP/M (818) 360-5053. Technical information, BBS lists, and help on CP/M assembly language program writing.

Oracle BBS (818) 980-6743, system password MICROTIMES, is a multi-interest, multi-user BBS running 6 phone lines on a CompuPro. Features include 8K messages, comments on messages, match-maker, adult material section, online CHAT between users and much more. 24 hr., 300/1200 baud.

The Agency BBS. 300 baud. Free. All systems welcome. 16 message bases, large data base of over 100 files on various subjects. Special areas for special interests such as gaming, business programs, and MIDI (Musical Instrument Digital Interface). 24 hours. (818) 794-5001.

The Audiophile Network. A databoard system for the music lover and audiophile. Information, specifications, prices and the latest news about hi-end stereo components. 24 hours, 7 days, unless down for repair. (818) 988-0452. (818) 782-1676 (voice) for info.

Speak Easy BBS. 300/1200 baud, runs on an IBM-AT with 26 megabytes. UL/DL with Xmodem, games, 20 message bases, dating service (questionnaire), voting booth. All computers invited! (818) 905-6262.

Ski Center West. 300 baud, full duplex. 50 ski resorts in western states. Bulletin board, E-mail, buy & sell equipment, merchant section, more. (818) 982-2530. Information (voice) (818) 982-3571.

Warren Communications Network. TI BBS, 24 hours, 300/1200 baud, graphics, speech, downloads. Sysop Douglas Davis. (818) 361-9294.

The Hotline Featuring Computer Entertainer Online. (818) 766-6442. The source for Newsbytes, computer news, software reviews, online with Dan, zap mail, movie and music charts, general interest and more. Unique Databoard available to public. On-line adventure with password. 8-N-1, 1200/2400 baud, 24 hours. Affiliated with Computer Entertainer Network. Sysop: Jon Badeuax.

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Lynzie's Motherboard (818) 508-6482/(213) 650-0519. 24 hours, 300/1200/2400 baud, 8-N-1. Private E-mail, download library, dating matchup, interactive chat between users, 4 phone lines on rotary. Public boards include emkployment, food and restaurant reviews, sci-fi, political, debate, for sale and many more. Monthly social happenings for local users. Sysop: Lynzie Flynn.

Light Artists, LTD. (818) 985-0541. 24 hrs, 300/1200/2400 baud. Sysops: Marty and Gerald Lehtola.

The Mogur's EMS. (818) 366-1238. Private and public e-mail, 20 special interest group message sections, 8 database sections, 27 megabytes, upload/download with xmodem, open to all systems, operating systems and users. Numerous unique and innovative features using custom software. In operation since 5/1/81. Multiuser with two lines, 2400/1200/300 baud, 8-1-N. Sysop: Tom Tcimpidis.

The Dugout. (818) 248-0562. Operates at 300 baud on a TI-99/4A but welcomes all systems. Includes message base, computer events, on-line adventure, xmodem d/l, and more. 6pm-11pm daily. Sysop: Jim Edwards.

The Talk Channel. (818) 506-0620 (Hollywood). (818) 507-1365 (Glendale). Both systems are 300/1200/2400 baud, 8/N/1, 24 hours, 10 lines, multi-user with private & group chat. Large UL/DL library, Data Base, 26 Public boards. California's largest BBS system. Sysop: Gary Clarkson.

LAACE (Los Angeles Atari Computer Enthusiasts). (818) 348-8644. 24 hour, 300/1200 baud, 10 meg online.

The Californian. (818) 368-7497. 300 baud, 24 hours. Color Bulletin Board System runs 24 hours a day, 7 days a week. Dedicated to the TRS-80 Color Computer, but other computers welcome. 9 sub-boards, more soon. No fees; only rule—no attempts to crash the system. Sysop: Jay B. Sanders.

Wizard of Osz RBBS. (818) 709-6978. 300/1200/2400, 24 hrs., CP/M or MS-DOS. Sysop: Mat Satuloff.

Atari Resource Magazine (ARM) (818) 446-5813. 24 hrs., 300 / 1200. Currently serving Atari and IBM computer users. Eleven message bases: general chatter, hangouts, advertise, for sale, XE Atari, ST Atari, modem, ul/dl, other BBS #s, Bible, job board. Sysops: Bob and Kim Reynolds.

RBBS (Bondwell SIG). (818) 787-0156. 300/1200 baud, CP/M and MS-DOS, 24 hours, 7 days. Everyone welcome. No time limit. Instant access to downloads. Files available for PC compatibles, Bondwell models 2 through 36. Hardware notes and tips. New product discussions. Sysop: Jon L. Bek.

Dodge City. (818) 241-4401. 24 hours, 300 baud, soon 1200. Great downloads that change every day. Sysop: The Sheriff.

The MacLodge BBS. (818) 444-9850. 8-N-1, 40 megs, 300/1200/2400. Hours M-F 3:30 pm-7 am; 24 hours on weekends and holidays. Macintosh up/downloads, plus Mac info. Mac users only please. Sysop: Dennis Cosio.

Greycastle BBS. (818) 796-5042. The bulletin board of the San Gabriel Valley Macintosh Users' Group. Operates 24 hours per day at 300 or 1200 baud. 5 megabytes available for 8 subboards, XModem file transfers on SnAPP software. Sysop: Bryan Menell, CompuServe ID 72307,2100, GEnie ID B.MENELL.

The Outpost RCP/M. (818) 353-8891, 300/1200 baud, 24 hours. Online games, occult and general text files, CP/M, Turbo Pascal. Sysop: Phil Hansford.

AT&T PC6300 Users' Group BBS. (818) 954-0530. 300/1200 baud, 8-N-1, 24 hours. Only So-Cal BBS "officially supported" by AT&T. Sysop: Eric L. Levinson.

Infotronics Computers BBS. (818) 282-7094, 300/1200 baud, 10 am-7 pm Mon-Sat, Sunday 12-5. 20 meg online. Message bases and file transfers for Macintosh (or Atari ST with Mac emulator), IBM (or Atari ST with IBM emulator) and even the Atari ST computers! (All computers are welcome.) We need users! No fee and plenty of elbow room—give us a call. Running on MichTron BBS software for Atari ST.

The LEDGE. (818) 352-3620. Southern California's finest PC/AT compatible support network, running on Leading Edge-D. Features the latest downloads, and professional assistance with all MS-DOS formats, message bases, doors, public domain shareware, plus immediate on-line access available. 24 hours, 8-N-1, 1200/2400 baud only. Affiliated with Computer Entertainer Network. Sysop: Joseph Sheppard.

AMP PC-RBBS. (818) 570-4406. 300/1200, 8-N-1, 24 hours. For IBM, program downloads and uploads, personal mail, public message system, 40 megs, no fee. New open sale conference for free for sale or wanted ads. Computer products offered at low price. Sysop: Edward Lee.

Affection Connection. (805) 527-7464, (818) 704-8588. 24 hrs., 7 days, 300/1200 baud. Multi-user BBS offering live on-line chatting, matchmaking. Sysop: Devin Woods.

Excalibur BBS. (818) 355-6949. Atari and other computers. 24 hours, 7 days, 300/1200. Sysop: White Knight.

The Computer Tele-Comm System. (818) 362-0995. 24 hours, 300/1200 baud, 8-N-1. We have meeting places, computer supplies. You can apply for credit cards. Enter our contest to win a 20 meg HardCard, 100 diskettes, $50 solid gold piece and more. We are the first BBS to offer an 800 toll free number. Call us direct the first time, after that call us free. Sysop: Dr. Jeffrey A. Keese.

See-Your-Match. (818) 445-0691. 24 hours, 300/1200. Sysop: Mel Minami.

PC Users Group and BBS For Desktop Publishing. (818) 445-8072. 24 hours, 300/1200/2400 baud. Sysop: Mel Minami.

Fantasy Plaza BBS. (818) 840-8066, 300 baud, 24 hours, 7 days. Fantasy Plaza departs from reality with the most unique and entertaining system you've ever seen! You will be impressed! Sysop: Gregg Collins.

Dial-Your-Match#1. (818) 842-6900. 24 hours, 7 days, 300/1200 baud. Meet new friends! The original and most unique friendship BBS. Online since October 1981. DYM network allows you to send messages across the USA.

Machiavelli Interface. (818) 659-1168. 8-N-1, 24 hours, 7 days, 300/1200. IBM and compatible PC board with Net-Mail feature. 30+ megs of downloads, conferences. Sysop: Dewayne Mikkelson.

Luv-A-Hug Moonbeams B.B.S. (818) 772-0384. 300/1200 baud, 8 data bits, 1 stop bit, no parity. Full access restricted to members of Luv-A-Hug only. 25 Megabytes online. IBM compatible, Z-100, and CP/M public domain software. Sysop: Greg Cook.

Dial-Your-Match #1. (818) 842-6900. 300/1200 baud, 24 hours, 7 days a week. We're not just for dating! Come enjoy a BBS that is "different" in every way! Make new friends the fun way! Call Today! Sysop Gregg Collins.

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Fantasy Plaza. (818) 840-8066. 24 hours, 7 days a week, 300 baud. An impressive experience where you will be treated to "red carpet" hospitality. A system that is not to be missed!

Teenplex BBS. (818) 289-6840. 300/1200 baud, 24 hours. A BBS devoted to teenagers. Message bases include: General, Games, Hardware, Software and Consulting. Supports Commodore and Atari file transfers. Sysop: Al Botts.

The Lunacy PC Board. (818) 894-1248. 8-N-1, 24 hours, 7 days, 300/1200/2400. 270 MB system with over 5,000 pubic domain files available. Five conferences, including games, music, PCjr, movies and astronomy. IBM compatible only. Running PC Board software with two nodes! Soon to go to 9600 baud. Operating since July 1985. Always the latest PD software. Online games and utilities. Free. Registration required. Sysop: Ken Ough.

The Ledge PC Board. (818) 352-3620. 8-N-1, 24 hours, 1200/2400 baud. All systems welcome. Featuring full support for IBM PC compatibles. Online software reviews from Computer Entertainer. Large library of MS-DOS programs. System supports several Doors including Top Gun Trivia, Create an Adventure II, and an ARC door where users may view or extract single files from .ARC files. Free to the public. Online registration gives full system access. Sysop: Joseph Sheppard.

Inner Realm. (818) 352-7102. 300/1200 baud, 24 hours. Atari Forum ST. Chess Club. Sysop: IR ROM.

The Space Station-Shopper/BBS. (818) 286-8539. 300 baud, 8-N-1, 24 hours. Brand new, check us out. Sysop: Hugo.

916

The Vortex BBS. (916) 481-0194. 24 hours, 300/1200 baud. Online and RPG games, new ones start often. Message boards include private mail, Dr. Who, game hints, endless story, play by mail. Vote on movies and weekly survey. Articles and BBS listings. No Fee. Register first call. Pamela Lunsford, sysop.

"The Meeting Place" BBS 300/1200/2400 baud. 24 hours, no parity. AE line for public domain downloads. Apple, Commodore, IBM programs available for download. Numerous general files. No fees, all free. Call (916) 662-1838. Woodland, CA.

Family Radio Forum. (415) 562-5483. 300/1200/2400, N-8-1, 24 hours. Download, upload, message, conference on parenting. For teens, singles, etc. Christian TBBS for everybody. Sysop: Richard Yim (voice 415/568-6200). Also (301) 261-1423 (Annapolis, MD), (712) 246-2115 (Shenandoah, IA), (916) 481-6320 (Sacramento, CA), (201) 736-1859 (Newark, NJ), (813) 269-7957 (Okeechobee, FL).

SAC TIBBS. (916) 927-3012. 24 hrs, 300/ 1200 baud, Xmodem downloads, graphics, speech. Free. Sysop: Woody Large.

The Devil's Domain BBS. (916) 268-1127. 8-N-1, 24 hours, 300/1200/2400 baud. 4 sub-boards including main, music, jokes/war, and elite. Up/downloading. General files. Voting topics, online gaming. A BBS devoted to have fun! Sysop: Asmodeus.

Uncle Tim's Hot Tub BBS. (916) 689-4670. 8-N-1, 300/1200 baud, 24 hours. A clothing optional experience coming live from Almost-Elk-Grove, California. Features: Main Hot Tub, Amiga Tub, Naturism/Nudism Tub, C Language Tub, Politics Tub, Tasteless Tub and Other Boards Tubs. No fees. System is as open as the software will allow. Registration unecessary but nice. We're new and growing! Give us a call, we'd love to hear from you! Sysop: Uncle Tim Beckwith.

Softy's Apple BBS. (916) 383-5244. 300/1200 baud, 8-N-1, 24 hours. An Apple BBS with a technical theme. We have boards for IBM as well. Retail store advertising with discounts for users of this BBS. Sysop: John Hagen.

ASSOCIATIONS

Community Entrepreneurs Organization (CEO). Business networking group meets in nine chapters around the Bay Area. Share information on tech and non-fech business issues. Topics, brainstorming and a chance to meet others in business. Various week nights. Contact Dr. Crandall, P.O. Box 2781, San Rafael CA 94912, (415) 435-4461. Also new Bulletin Board, (415) 552-9070.

IEEE Computer Societies Committee on Artificial Intelligence and Expert Systems sponsors an open meeting the third Thursday of every month, 7-10 pm, at Foothill College. For more information please call the IEEE council office at (415) 327-6622.

Computer Professionals For Social Responsibility. P.O. Box 717, Palo Alto, CA 94301. (415) 322-3778.

Computer Professionals For Social Responsibility (East Bay). 902 Rose Ave., Piedmont, CA 94611. Contact Bruce Joffe, (415) 768-0288 days, (415) 654-5263 eves.

FOCUS-MED (Federation of Computer Users in Medicine). Open to all physicians and health professionals. Practice management consultant registry. (415) 626-4600.

FOCUS-DDS (Federation of Computer Users in Dentistry). Open to all dentists and dental professionals. Practice management consultant registry. (415) 626-4600.

ITRA Independent Technical Representative Association is an organization dedicated to helping people better understand the Personal Computer (IBM). Contact Tim Jones, 870 Market St. 609, San Francisco, CA 94102, (415) 421-4872 for meeting time and date.

MCTUG (formerly Marin County TRS-80 Users' Group). MS-DOS, CP/M and Tandy users group. Meets 7:30 pm on the first Monday of the month at the Larkspur Masonic Lodge, 1122 Magnolia Ave., Larkspur. Contact Dr. Frank Hovell, 907 Sprucewood Court, Petaluma, CA 94952, (707) 762-5740.

PRACSA (Public Remote Access Computer Standards Association) offers to clubs, schools, and user groups a Speakers Bureau. The purpose of the bureau is to act as a resource to these groups in obtaining speakers of high quality for their meetings. The volunteer speaker is provided free to the group. Contact (408) 262-5150. Meetings 4th Wednesday, 7 pm, Vadic Cafeteria, 222 Caspian Dr., Sunnyvale.

San Bruno Computer Core. Meets 7:30 pm alternate Wednesdays. Call (415) 952-9309 for address and info.

San Francisco Computer Society (Formerly the San Francisco First Osborne Group). A society for users of portable computers and/or the CP/M operating system. P.O. Box 783, San Francisco, CA 94101-0783. Meetings on fourth Thursday of the month, St. Aidan's Church, Diamond Heights and Goldmine Dr. in SF. All are invited. Dues $10/yr.

Software Entrepreneurs' Forum, PO Box 61031, Palo Alto, CA 94306. (415) 854-7219.

PATCA (Professional & Technical Consultants Association). 1330 S. Bascom Ave., Suite D, San Jose, CA 95128. (408) 287-8703.

BAYMUG. Bay Area Micro-Processor User Group. General computer group, mostly CP/M and S100. All types of interests welcome. Celebrating our 10th year of meetings! Meetings 1441 Rolins Rd., Burlingame, CA, 1st Thursday, 7:30 p.m. Contact Victor K. Bailey, P.O. Box 248, Pleasanton, CA. 94566. (415) 462-4442.

Byte Hum. A user group for computer buffs concerned with human needs, or social activists who want to learn about computers. Let's put all that knowledge to work for social transformation! Sponsored by the Humanist Party. Contact Rick Wall, (415) 495-6555 or (415) 337-2530.

Society for Technical Communication. STC is a professional organization dedicated to furthering the art of technical communication. The San Francisco chapter has about 200 members. Writers, artists and others interested in technical communications are welcome. Meetings 3rd Wednesday of every month, 5:30-7:00 pm; call Sarah Collings, (415) 383-9631 for info.

North Bay Users Group (NBUG). Family computer club devoted to all aspects of computing. Monthly newsletter, library, software demos, etc. Meetings at "CAVE" school, 2nd Tuesday of the month, 7:30-10 pm. Contact Gloria Hutchinson, P.O. Box 7116, Vallejo, CA 94590, or call (707) 644-9327.

Robotics Society of America. Dedicated to disseminating information about robotics, artificial intelligence and machine controls. Mailing address 36 Newell St., San Francisco, CA 94133, (415) 673-2376. San Francisco chapter meets 2nd Monday of the month, 8 pm, Homestead Savings 5757 Geary Blvd. Contact Jim Strope, (415) 552-6564. Berkeley branch meets 6:30 pm, last Wednesday of the month, Claremont Branch, Berkeley Library, Ashby and Benvenue. Contact Soren Knudson, (415) 843-2344. Sunnyvale Pongbotics meets in Sunnyvale on the De Anza College campus, Room 22, first three Wednesdays of the month, 7:30 pm. Contact Bill Lee, (408) 281-2252.

Silicon Valley Computer Society. Meetings 7:30 pm, second Wednesday of the month, Duane and Britton SE corner, Sunnyvale. Contact Dick Verna, (408) 262-2679 for information.

PicoNet. A microcomputer users group. Meets on the second Thursday of each month at 7:30 pm at CMX Corp., 2230 Martin Ave., Santa Clara, CA. Formerly specialized in CP/M software, but has broadened its scope to encompass the entire field of computer-related high technology. Extensive library of CP/M pd software; preparing PC-DOS library. Monthly meetings, periodic newsletter, BBS, C language SIG. Call (408) 374-8090 for recorded

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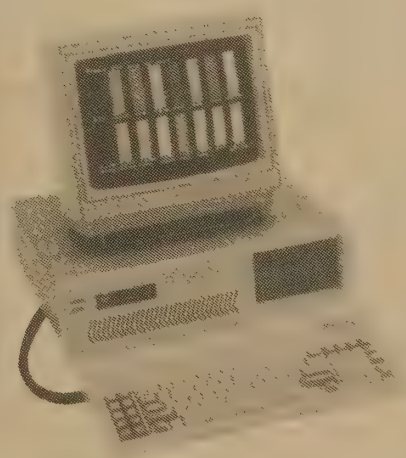

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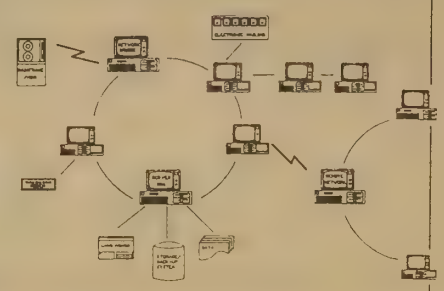

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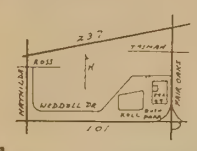

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C Group of Northern California. Forming C programmer support group. Group's function will be to exchange information, discuss programming techniques and problems, etc. Anticipate monthly meetings at rotating locations. First meeting to be held 7:30 pm, Tuesday evening, November 4th, in Mill Valley. Call (415) 383-7006, or contact Ben T. Choate III, P.O. Box 1533, Mill Valley, CA 94942.

BADGE-Bay Area Developers Group. Meets third Thursday of every month, 7:30 pm, at Stanford University Building 200, Room 002. Contact Tom Rokicki or Bob Alverson, (415) 326-5312 for information.

California Genealogical Society Computer Interest Group. Meets second Saturday of the month, 300 Brannan St., 4th Floor, San Francisco. Call W.R. Shepard, (415) 989-5441 for information.

Hebrew Users Group., Supporting the use of Hebrew and Hebrew-based languages on computers. Contact Jack Love, (415) 845-7793 (Berkeley Hillel).

Gay/Lesbian PC Users Group. We meet on the second Sunday of each month. This is the group where we show our hardware and software and share our knowledge. All levels of users are welcome. Meeting place is the MCC San Francisco, 150 Eureka Street. For more info, contact Jim at P.O. Box 42429, San Francisco, CA 94101, (415) 334-9761.

NATIONAL/ INTERNATIONAL

Network Users Association. 2111 Eisenhower Ave., Suite 400, Alexandria, VA 22314. (800) 638-8510 or (703) 683-8500.

TPUG World's largest Commodore Users Group. $25 annual membership entitles you to access to library of public domain software for C-64, VIC 20, PET, CBM, SuperPET, B-128. Coming soon Plus 4, C-16, C-128. New disks added each month. Also TPUG Magazine (10 per year), free access to TPUG's Bulletin Board Modem System, 24 hours, 7 days. TPUG Inc., 5300 Young St., Willowdale, Ontario, Canada M2N5R2, (416) 733-2933.

Apple Co-op. 290 SW 43rd, Renton, WA 98055. (201) 251-5222.

JUG (Jefferson State Computer Users Group). Many SIGs, newsletter. Dues $5.00 year, some SIGs additional. Contact JUG, P.O. Box 457, Gold Hill, OR 97525-0457.

MicroPro Users Group of America. National group with over 200 members worldwide. Dedicated to supporting MicroPro products, especially WordStar and InfoStar, for any hardware. c/o Procyon Associates, 140 Riverside Drive, New York, NY 10024. (212) 595-4811.

Golden Apple Club, Apple II and Macintosh. Contact Stefano Minotto, Golden Apple Club, Riviera Tiso da Camposanpiero, 26, 35100 Padua, Italy.

F.O.G. 15,000 member group supporting all CP/M users. Dues of $24.00/yr. include 60-80 pg. FOGHORN monthly's access to 270+ disk library, 40+ RCP/M systems, and back issues; and a technical support hotline. All meetings conducted by 140+ local groups. Gale P. Rhoades, P.O. Box 3474, Daly City, CA 94015, (415) 755-2000.

Getec s.r.l. Contact Silvio Esengrini, Via dei Guarneri Nr. 24,-20141 Milan, Italy. Phone: 39/2/5696502, 39/21 5694185.

Italtel S.p.a. Contact Michelangello Sala, C.Na, Castelletto, 20090 Settimo Milanese, Milan, Italy. Phone 39-2-4388-4288.

PLUG (The Plus/4 Users' Group). Dedicated solely to support of the Commodore Plus/4. No regular meetings, 200 members in US, Canada, Mexico, and Europe. Newsletter, public domain software library. P.O. Box 1001, Monterey, CA 93942.

KAPPA (Memphis Kaypro Users Group). Meetings at 2 pm, 1st Saturday of the month, Room 2, Jennings Hall. Contact Hugh Lamar, 5983 Macon Cove, Memphis, TN. (901) 377-4140.

The AppleWorks Users Group (TAWUG). c/o Regional Rep, 27421 Berenda Way, Hayward, CA 94544, (415) 887-7499.

FORTH Interest Group, International Office. P.O. Box 8231, San Jose, CA 95155. For further information call (408) 277-0668.

Apricot User Group (APRICUG). Box 98, Malverne, NY 11565.

Spellbinder Users' Group has an international newsletter with useful macros written by members, advice on new applications, news, and word-processing problem solving. All experience levels. California members welcome. Write P.O. Box 14, Newark, Notts, England NG24 4TP; telephone (0636) 77313; telecom Gold/Dialcom Mailbox 72: MAG95610.

National TeleVideo Users Group. Meets 7:30 pm, 3rd Thursday, 1170 Morse Ave., Sunnyvale. P.O. Box 22007, San Francisco, CA 94122. Call for info—David, (415) 753-1552.

Apple Fontrix Club. Monthly newsletter. P.O. Box 29857, Thornton, CO 80229-0857.

N.A.B.V.I.C.U. - The National Association of Blind and Visually Impaired Computer Users. The purpose of this group is to gather information that will assist the blind or visually impaired person in utilizing the enromous potential of computers. It supports **CompuHelp**, a menu driven database-bulletin board programmed for use by the blind and visually impaired. It is available 24 hours a day, 7-days a week, 300/1200 baud, 8 or 7 bits, even or no parity, 1 stop bit. (916) 786-3923. Compuhelp is also available on disks. For more info, contact Otto C. Haiungs, Chief Executive Officer, Sysop, at P.O. Box 1352, Roseville, CA 95661-1352. (916) 783-0364.

28 Barbary Lane. Meets at 121 13th Ave. East, Seattle, WA, Fridays 8:00 pm. Contact A. Madrigal, (206) 323-2828. BBS: (206) 323-2828.

Microenvironmental Information Consortium For Researchers Overseas. World Headquarters, 712 Avery Rd. W. Winlock, Washington 98596, USA. Washington phone: (206) 262-0159. California phone: (415) 524-9309. Micro on MCI mail, ECONET & WELL TELEX number 6502928733 via WUI.

USER GROUPS

APL

APLBUG (APL Bay Area Users' Group) has monthly meetings and a newsletter for people interested in APL (A Programming Language). It meets the third Monday of each month at 7:30 pm in the offices of I.P. Sharp Associates, 220 California Avenue, Palo Alto. Annual dues are $15. Contact Curtis Jones, (408) 292-4060, for information.

AT&T

Bay Area AT&T PC6300 Users' Group. Official group supported by AT&T. Meeting time and location vary. Contact Victor A. Borromeo, 764 St. Francis Blvd., Daly City, CA 94015. (415) 477-8124 days, (415) 991-4164 eves/weekends, or Maurice Aranda, (415) 972-5436 for information. BBS (415) 652-8277, 1200/2400, 8-N-1, 24 hours, 7 days.

ACTRIX

ACTRIX Computer Enthusiast Society. Membership ($20/yr) provides public domain software, group rates, discounts for owners of Actrix/Access Matrix microcomputers. Meetings at Sunnyvale Community Center, last Wednesday of the month, 7 pm. Contact K. Edward Lynch, 1405 Phelps Ave. #29, San Jose 95117, (408) 756-5104, for more information.

ADAM

Coleco Adam Users Group. For info send SASE to: CAUG, 2316 Stuart St., Berkeley, CA 94705. Voice (415) 549-3437, data (415) 549-3378.

South Bay ADAM Users' Group. Now forming a users' group exclusively for the ADAM enthusiast in the south bay area. Call Steve for more info at (408) 253-4190.

East Bay ADAM Group. Forming an ADAM users group in the East Bay area. Call Tom for more information — (415) 886-2884, or write 6097 Slopeview Ct., Castro Valley, CA 94552.

AMIGA

First Amiga User Group. We offer demonstrations of software and hardware, a public domain library, and general user help at our monthly meetings, which are held on the first Tuesday of each month in Belmont, CA. Meeting address 1300 Fifth Ave., Belmont, CA, 94070, 7 pm, first Tuesday of the month. Contact Tim Avery/Kayvan Pejooh, (415) 595-5452.

First Amiga User Group the South Bay. End-users, enthusiasts, developers and programmers all welcome. Meetings 2nd Fridays, library, 40 N. Milpitas Blvd., Milpitas, 7-9 pm. Contact Jim Thomas, P.O. 1863, Fremont, CA 94538, (415) 651-0201. BBS (415) 659-9169.

ACCESS. The Amiga and Commodore Computer EnthusiastS Society (ACCESS) holds its meetings on the 3rd Wednesday of the month in Room 107 of the Chabot Building in Hacienda Business Park, Pleasanton, CA. Contact Skip Perkins, (415) 443-4778 for information.

Sacramento Amiga Computer Club (SACC). Meets the second Wednesday of each month at the Sacramento Municipal Utility District (SMUD) auditorium, 6201 S. St. just off Hwy 50 at the 59th or 65th St. exit, 7 pm. For more information call George Leone, president, at (916) 944-7400 or write to SACC, P.O. Box 19784, Sacramento CA 95819-0784.

Amiga East Bay Info Exchange (AEBIE). P.O. Box 485, Pinole, CA 94564. For end users in the West County, North and/or East Bay area.

AD-Amiga Developers Group. Meets the last Monday of each month at 6 pm, 2618 Telegraph Ave., Berkeley, (415) 845-4814.

AEBUG-Amiga East Bay User Group. The Original Users Group meets the second Wednesday of each month at 2618 Telegraph Ave., Berkeley, 7 pm. (415) 845-4814 for information; BBS (415) 845-4812.

AUGment, the Amiga User's Group of Silicon Valley. P.O. Box 1863, Fremont, CA 94538-0186. Contact: Jim Thomas. Information line: (415) 651-1160. BBS: (415) 659-9169. Meetings every second Friday at Hewlett-Packard, 5301 Stevens Creek Blvd., Cupertino.

Amiga Addicts Anonymous. Meets the third Monday of each month, 7:30 pm, at 1331 Concord Ave., Concord (CCC Water District) CA. For more into, contact Jeff Chase, president, P.O. Box 4669, Walnut Creek, CA 94596. (415) 933-0217. BBS: (415) 283-5469.

AUM-Amiga Users of Marin. Meets the third Wednesday of each month, 7:30, at the College of Marin, Science Center, #190, Kentfield, CA. For more info, contact Bob Galvan, 119 Willow, Corte Madera, CA 94925. (415) 924-5384.

Stockton - Modesto Amiga Users Group (SMAUG). Meets last Wednesday of each month at 3525 Benjamin Holt Drive, Central Lounge, Willow Glen Apts., Stockton, 7:30pm. For information call Rainer Kummerle. (209) 957-8620.

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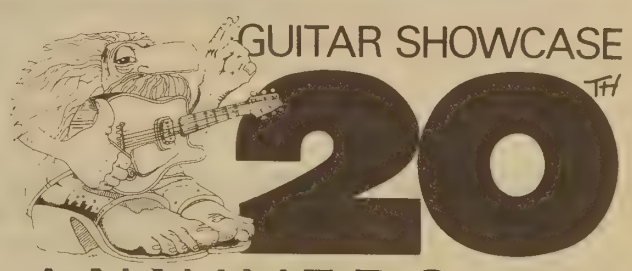

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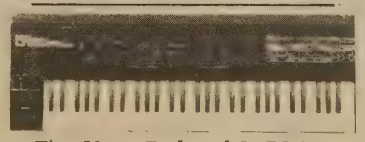

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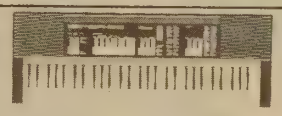

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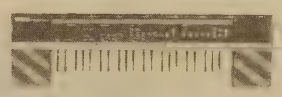

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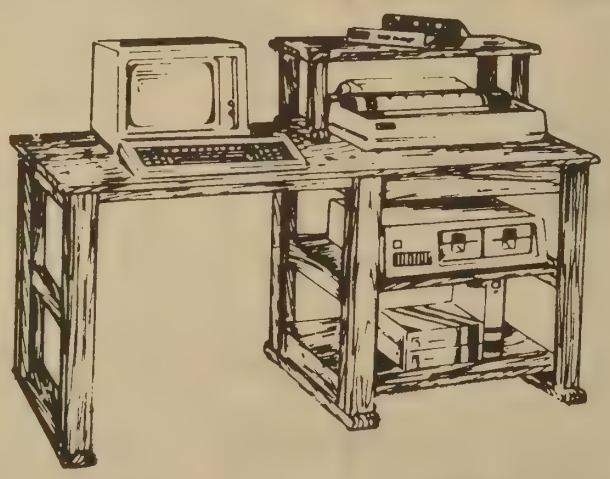

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The AppleWorks Users Group. c/o TAWUG Regional Rep., 27421 Berenda Way, Hayward, CA 94544.

SPCA (Society For The Prevention of Cruelty To Apples) Apple user/interest group. Features: Monthly meeting with newsletter, raffle and door prize hard / software, demonstrations, lectures, discussions, $20 per year, pro-rated after June. Meetings last Wednesday of month, 7:30 pm. Contact Paul Meyerholtz for info (415) 490-8209.

Association of Apple 32 Users Macintosh, Lisa. An association of "knowledge workers" who wish to share information on products, applications, and events. User-developed, non-copyrighted software, SIGS, newsletter. P.O. Box 634, Santa Clara, CA 95052.

San Leandro Apple Eaters Users Group. Apple II users group meets the first Thursday of each month at San Leandro High School (room 213). New owners to experienced users welcome: Appleworks, education, hardware/software, telecommunications. Call Open Campus BBS area 11 (415-895-0135) or voice (415-782-9250) for more information.

Pen-Apple (Peninsula Apple Users Group) Meetings 2nd Thursday each month at 7:30 pm, Ampex Corporation cafeteria, 421 Broadway, Redwood City. Contact Pierre Testart, (415) 952-9309.

Diablo Valley Apple Users. Apple II family users and Macintosh users. Special Interest Groups meet monthly. Featuring a library of public domain software collection and our own Club's DOM's, monthly newsletter, group buys of hardware and software as well as monthly demos of new products. Meetings held on 1st and 3rd Friday each month at 7 pm at the Willow Creek Center, 1026 Mohr Lane in Concord. Contact Merle Zmak, president, P.O. Box 5031 Concord, CA 94524, or call (415) 672-7596 for additional information.

South Peninsula Apple Computer Enthusiasts (c/o David Harris, P.O. Box 1257, Palo Alto, CA 94302) meets near the Varian Credit Union, Bldg. 4C, 611 Hansen Way, Palo Alto, at 7:30 pm on the first Tuesday of every month to exchange information about available hardware, software, events, publications, and methods on Apples, and to encourage collaboration on projects. Call (415) 856-9126 answering machine takes 30-second messages.

Roseville Apple Core. Discover your Apple's Core! We meet on the second Wednesday and fourth Tuesday of each month, 7:00, at SMUD Foothills Bldg., Training Room D, at Don Julio and Elkhorn. There are additional SIG meetings for AppleWorks, BASIC, Telcom and Macintosh. We also feature a monthly bulletin, large public domain library, and new member's disk, all for just $12 yearly membership. C'mon out and bring a friend. For more info, contact Bruce McLeod, president, P.O. Box 1377, Roseville, CA 94551. (916) 723-6422.

Apple Sac. (Sacramento) Meetings on first Wednesday and third Tuesday every month at Madison School, 5241 Harrison St. (corner Harrison and Madison Ave. 1/4 mile west of 180 on Madison Ave.), 7:30 pm. Contact Ray Beam, president, P.O. Box 254645, Sacramento, CA 95825, (916) 448-6115 for more information.

Stanislaus Apple Group. You're invited! Stanislaus Apple Group meets 2nd Tuesday each month, 7 pm, Room 124 Ag Bldg, Modesto JC, main campus. We support Apple II and compatibles, Apple III, Mac, Lisa. Newsletter, BBS (209-529-3202), extensive PD software library. More info call (209) 523-7289 (eves).

Santa Cruz Apple User's Group meets at Cabrillo College, Aptos, ILC building, 1:30 pm, second Sunday of the month. For information contact Tim Ruckle, president, (408) 462-3154.

Apple Gardens. New Apple II users group. Share info, programs, group purchases. Brand name disk, new products, software demos and evaluations. Call Tom Turley at (415) 468-4045.

Apple P.I.E. Meets at Lynbrook High School, Room 30, 1280 Johnson Ave., San Jose, 4th Thursdays, 7:30 pm. Contact George Ingalls, P.O. Box 2185, Santa Clara, CA 95055.

ATUNC-Apple Three Users of Northern California. Explanations, demos, large public domain library. Mailing address: P.O. Box 1528, Mill Valley, CA 94942. On Apex and Draconet BBSs.

Apple East Bay Users. Meets the first Tuesday of each month at 2618 Telegraph Avenue, Berkeley, at 7 pm. (415) 845-4814 for information; BBS (415) 845-4812.

Apple Pickers of Sonoma County. Meets second Saturday of each month, 1735 Shuhaw Hall, SRJC, 1 pm. Call for sample newsletter: Mary Lou Mayes, (707) 763-8322.

TVAUG-Tri Valley Apple User's Group. Meets on the first Thursday of each month, 6:30 at 7079 Commerce Circle, Pleasanton, near the intersection of Hwys. 580 and 680, to discuss our Apple IIs. A special beginners group meets on the second Thursday of each month. For more info, contact Dan Balsley or Esther Farnstrom, 9814 Davona Drive, San Ramon, CA 94583. (415) 828-6237 or (415) 829-3672.

Apple Blossom User Group. Meets 1st and 3rd Wednesday of each month at 7 pm at 290 International Circle, San Jose CA 95119. All Apple users welcome. Apple II, II+, IIc, IIe, III and Macintosh. No matter which Apple you have we have a group for you. Contact Ray Enochs, P.O. Box 53323, San Jose CA 95153. (408) 723-9141. ABUG BBS (408) 227-3993.

Microcomputer Users Of Santa Cruz (MUSC). A FOG affiliate, membership open to all persons interested in MS-DOS or CP/M computers. Meetings the second Tuesday of each month. Wheelchair access. Guest speakers, demonstrations, MS-DOS and CP/M software libraries. Info: Barney Bricmont. 1920 Maciel Avenue, Santa Cruz, CA 94062. (408) 476-0504.

ASHTON-TATE

Framework/Editor Bay Area Users Group (FREDBUG) Purpose of the group is to share programming and applications techniques under FRAMEWORK for the business and technical professional. Call for info: Rudi Wiedemann, (408) 730-4159.

San Francisco dBase User Group For advanced users and programmers. Meets once per month. Membership required for attendance. Contact Frank A. De Coster, 1100 Gough St., San Francisco, CA 94109, (415) 474-6693.

East Bay dBASE Users Group. Meets 3rd Sunday, 1 pm. Call Darrell Bross (415)873-7522 or Alexandra Saur (415)893-7637 for meeting address.

dBase II/III SIG of SF PC Users Group meets third Monday of each month, 7-8 pm, Fort Mason, San Francisco. Contact Ron Freshman, (415) 459-6613.

DBDVLPRS (dBaseIII Program Developers). Call for information on meeting time and location: Gil Orlik, (415) 931-0377, 2240 Buchanan St., SF 94115.

ATARI

ABACUS (Atari Bay Area Computer Users Society) All ATARI users or prospective users are welcome. Membership ($15/year) provides public domain software, low cost blank disks, monthly newsletter, group prices on hardware and software, help from experts, low cost classes for beginners. Meetings first Saturday of the month, Fort Mason, SF, Room 300, Bldg. C, 10 am-2 pm. Contact Bill Zinn, P.O. Box 1823, Mill Valley, CA 94941. (415) 753-8483.

A.C.M.E. (Atari Computer Marin Enthusiasts) Meets monthly in Marin, third Thursday evening monthly from 7 pm on. Gallinas School, 177 N. San Pedro Rd., San Rafael. Contact Bruce Frank, (415) 435-6020, P.O. Box 222, Tiburon, CA 94920.

Diablo Valley Atari Computer Enthusiasts (D.A.C.E.) Meets the first Thrusday of the month at 7:00pm at the Contra Costa Water District Building conference room in Concord. Meetings free. $20 yearly membership comes with newsletter, discounts, raffle tickets. For information contact Mike at (415) 798-6565.

Bay Area Atari Users Group We have a 24-hour 300/1200 baud BBS at (408) 249-7722. Meetings at Bracher School Cafeteria, corner of Bowers and Chromite, Santa Clara, CA, first Monday of the month. Contact Frank Nagle, P.O. Box 50459, Palo Alto, CA 94303, (415) 791-5461 for more info.

San Leandro Computer Club Although open to all computer users, this group is primarily oriented to Atari computer owners. Our club is considered one of the best in the country, worthy of consideration by both novices and experts. Meetings 1st Tuesday of the month at San Leandro Community Library, 300 Estudillo Ave., San Leandro, CA. Contact Phil Mitchell, P.O. Box 1525, San Leandro, CA 94577-0152 for more info, or call (415) 351-2208.

COAST User Group (California Original Atari ST). Public domain disks, MIDI, support, newsletter, help for the Atari ST line of computers. Advice and programs not to miss. Meetings on the 3rd Wednesday of each month, at The Berkeley Conference Center, 2105 Bancroft in Berkeley, CA, 7:00 pm, 6:30 for beginners. $1.00 admission for non-members. EaST COAST meets 2nd Tuesday of the month at 1015 Esther Drive, Pleasant Hill, 7:30 pm. Members only. Dues $30.00 yr. Contact Chuck Thorp, president, 1015 Esther Drive, Pleasant Hill, CA 94523, (415) 945-1949 for information.

Redwood Atari Group (R.A.G.) Meets 4th Saturday, 1-4 pm, at Coddingtown Meeting Room, 1100-B Coddingtown Center, Santa Rosa. Contact Mikkel Lawrence, (707)585-3949, 21 Creekwood Sq., Rohnert Park 94928.

ATTACHE

Attache UNL Otrona may be dead, but the Attache Users News Letter Lives ON!! Contact Jim Ayers, 301 Poplar St., Mill Valley, CA 94941. (415) 388-4805. Meetings 7:30 pm, 2nd Wednesday.

First Attache User Group News. Support, news, and cooperation for users of Otrona Attache and 2001 portable computers. Since '82. Contact Charles Raisch, 1827 Haight St. Suite 16, San Francisco, Ca 94117, (415) 221-3415.

AUTOCAD

AutoCAD Users Group. Call Gen Katz (415) 530-8870 for information about future meetings.

AutoCAD User Group. Call Volker Ackermann, (415) 485-0958 for information.

AutoCAD Users Group of Santa Cruz. Meetings held at Citicorp conference room, 806 Ocean Street, Santa Cruz, 7-9 pm, 1st and 3rd Tuesday of the month. Call (408) 462-0448 for information.

BASIS

Bay BUG Basis 108 Users meet every first Friday of the month at College of Alameda Computer Room, 7:30 pm. Contact Roger Bernhardt, 536 Mission, San Francisco or call (415) 221-0262 for more information.

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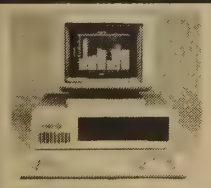

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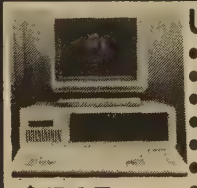

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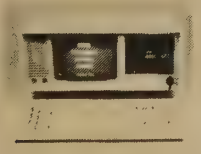

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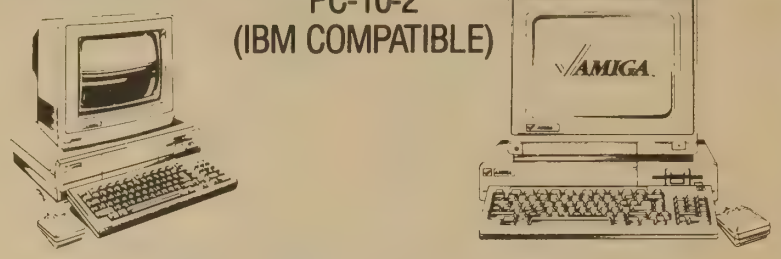

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Bondwell Users Unite! Trying to start group, need your help. All levels welcome. Meeting address 405 Stierlin Rd. #17, Mountain View. Time and date to be announced. Call Tom Gatlin at (415) 961-0450 for more information.

BPI

Bay Area BPI Users Group meets the fourth Tuesday of each month. For more information contact Mitch Paioff, 5097 Tisdale Way, San Jose, CA 95130, (408) 866-4310.

CANNON

Cannon AS 100. Anyone who owns a Cannon AS-100 computer and is interested in forming a group to share problems and solutions write HTF-4111 Hilltop, Vacaville, CA 95688.

CASIO

Casio Research Project. Discussion and collaboration; creation of plug-in expansion board using VLSI chip. Share programs. Meetings TBA. Contact Julius M. Zebrowski, (415) 969-9458.

COMMODORE

San Francisco Commodore Users Group (SFCUG). Meets the last Thursday of each month at the Embarcadero YMCA near Steuart and Howard. All Commodore computer enthusiasts welcome. PD library, classes, in-depth demonstration, eprom programmer, BBS-ET (415) 861-4485. Contact Malcolm Lowe, (415) 832-1539.

Diablo Valley Commodore Users Group Meetings Contra Costa Water District Auditorium, 1331 Concord Ave., Concord, CA, second Thursday of month at 7:30 pm. Write DVCUG, P.O. Box 27155, Concord, CA 94527, or call (415) 838-2838 for more info.

Napa Valley Commodore Computer Club Meets first and third Mondays, 7:30 pm, at Northwood Elementary School, 2214 Berk St., Napa. Take Redwood Road to Dover St. to Berk St. Contact President Dick Bull (707) 257-3773 or vice-president Roger Pruym (707) 253-1690 for more info.

Lake County Commodore Users Group Contact Al Reuss, P.O. Box 388, Clearlake, CA 95422.

Marin Commodore Club Meets at Redwood High School, Corte Madera. Visitors welcome. Contact Elmer Johnson for information: 665 Las Colindas, San Rafael, (415) 479-0426.

Peninsula Commodore User Group Public domain library, demonstrations, user help, newsletter. Membership is $25 per year. Non-members pay $2 at door. Meetings are 3rd Tuesday of each month. Meeting place is the Church of the Good Shepherd Hall, 1300 5th Ave., Belmont (across from city hall). For more info call (415) 595-5452 between 9 am and 6 pm, or call our BBS at the same number after 6 pm.

The Commodore Connection User Group. (CCUG) Meetings at Homestead Savings, 14th and "A" St., Antioch, 3rd Monday of the month, 7:30 pm. Contact Walt Moxely, 2229 Santa Maria Drive, Pittsburg, CA 94565. (415) 458-3318. BBS: (415) 458-1005, Commodore only, 24 hours, 300/1200.

Commodore User's Group of Hayward. The CUG of Hayward meets the first Saturday of each month from 3 to 5 pm at the Commodore Computer Center located at 22521 2nd St., Hayward. Call (415) 886-1916 evenings between 5 - 8 pm or (415) 537-1323 days between 10 am and 5 pm.

NBUG (North Bay Users Group). Contact Jim Stephens, president, 124 Delgado St., Vallejo, CA 94591, or write P.O. Box 7116, Vallejo, CA 94590.

Santa Rosa Commodore Users Group. Walter Saures, President, 333 East Robles Ave., Santa Rosa, CA 95407-7921. (707) 584-7009. Information line, (707) 526-6464 SRCUG-BBS.

Family Roots Searchers. Using Commodore SX-64 computer, Dynax DX-15, PractCalc II, Word Pro 3 Plus, Family Tree. Meetings by appointment only. Vera Ross, Atchison Village, Richmond, CA 94801-2942, (415) 235-8716.

PLUG (The Plus/4 Users' Group). Dedicated solely to support of the Commodore Plus/4. No regular meetings, 200 members in US, Canada, Mexico, and Europe. Newsletter, public domain software library. P.O. Box 1001, Monterey, CA 93942.

Silicon Valley Commodore Computer Club. Meets 4th Wednesdays, H.P., 5301 Stevens Creek Blvd. at Lawrence, 7 pm. Contact Roger Weiss, (408) 942-2442.

ACCESS. The Amiga and Commodore Computer EnthusiastS Society (ACCESS) holds its meetings on the 3rd Wednesday of the month in Room 107 of the Chabot Building in Hacienda Business Park, Pleasanton, CA. Contact Skip Perkins, (415) 443-4778 for information.

C.O.W. Commodore Owners Workshop. Meets at the San Bruno Rec Center (in San Bruno Park) the third Thursday of every month from 7-10 pm. Machines welcome. We have a huge PD library that users can check out. We usually have demos each meeting; we have BASIC programming classes and help each other along. For further information call the San Bruno Parks and Rec at (415) 588-1201.

Fairfield Commodore User Group. Meetings Solano County Education Bldg., 1st and 3rd Mondays. Contact Ben Harris, 1182 Dana Dr. Fairfield 94533, (707) 422-1669.

FUNHUG — Fremont, Union City, Newark, Hayward Users Group. A user organized, user operated, user group not affiliated with any computer or software manufacturer or distributor. We have a Commodore and an IBM section in our group. Group meets every third Wednesday at 7:30 at 5445 Central Ave., Suite 4, Newark.

64/MORE, San Jose Chapter. Meets the first Sunday of each month from 6 pm to 9 pm at Mercury Savings and Loan, 859 Blossom Hill Road, San Jose. For further information call (408) 945-4327 or Night Owl BBS (408) 253-2295.

64/MORE, North Valley Chapter. Meets the second Saturday of each month from 10 am to noon at the Milpitas Public Library, 40 Milpitas Boulevard, Milpitas. For information call (408) 945-4327 or Night Owl BBS (408) 253-2295.

64/MORE, Cupertino Chapter. Meets the third Saturday of each month from 3 pm to 6 pm at the Saratoga Public Library, 13650 Saratoga Avenue, Saratoga. For further information call (408) 945-4327 or Night Owl BBS (408) 253-2295.

64/MORE, Campbell Chapter. Meets the fourth Tuesday of each month from 6:30 pm to 9:30 pm at the Santa Clara County Public Health Building, 2220 Moorpark Avenue, San Jose. For further information call (408) 945-4327 or Night Owl BBS (408) 253-2295.

Microcomputer Users Of Santa Cruz (MUSC). A FOG affiliate, membership open to all persons interested in MS-DOS or CP/M computers. Meetings the second Tuesday of each month. Wheelchair access. Guest speakers, demonstrations, MS-DOS and CP/M software librar-

COMPAQ

SF Compaq Users Group is now a SIG of the SF IBM PC Users Group. For information please call D. Blow at (415) 221-2764.

COMPUPRO

Berkeley Compupro. Berkeley Compupro User Group meets 4th Thursday every other month. Company Reps attend meetings. For more information call Barry at (415) 554-4733.

Hayward Compupro Users Group. Meets 3rd Saturday of every month in Hayward, California. Sponsored by Automation Sciences International. Meetings held at 22532 Foothill Blvd., Hayward, between 'B' and 'A' Streets. You may call (voice) (415) 886-2980 or (modem) (415) 886-4734. The CP/M Connection for further information." Topics include: hardware & software problem identification and solution, upgrades, new products, CP/M, CCP/M, ZCPR and getting the most out of application software. Other users and interested parties are welcome. Group founder: Michael D. Lipshutz.

DATAFLEX

Dataflex User Group. For more information call Alex at (415) 433-7944.

DEC

Silicon Valley DEC PC Users Group. Meets 2nd Wednesdays 7–9 pm at Kierulff Systems 1180 Murphy Avenue, San Jose. Contact Gary Catalano (408) 275-1133.

DYNABYTE

Dynabyte Announcing M.A.D., Mutual Assistance, Dynabyters (Dinosaurians?) For owners of this orphan Z80 S100 machine. Call Woody McPheeters, (415) 548-3126 or write 3128 King St., Berkeley, CA 94703.

EAGLE

Eagle Computer Users Group. P.O. Box 3381, Saratoga, CA 95070, (408) 972-1965. General meetings are held on the second Saturday of the month at Tandem Computer H.R. Training Room at 10300 N. Tantau Ave., Cupertino, from 9:30 am to 12:00 noon.

Screaming Eagles User Group For 8 and 16 bit Eagles. Quarterly newsletter, public domain disk. On CompuServe (CLUB) Sec. 3. $10/year individual, $20/year business. 101 Parnassus #1, San Francisco, CA 94117. (Voice) (415) 661-4362.

Eagle Computer Users Group —ECUG. Meets 2nd Mondays, 7 pm, 6132—66th Ave. (Southgate Library), Sacramento. Contact W. Jud Boies, P.O. Box 163506, Sacramento, CA 95816, (916) 443-1060.

ENABLE

ENABLE Users' Group. Supporting users of Enable, the integrated software package. Monthly meetings in San Francisco (contact Evan Christensen, 415/469-1863) and Walnut Creek (contact Sandi Baker, 415/944-0426).

EPSON

Bay Area Epson Salts 125 Del Centro, Millbrae, CA 94030, (415) 697-0567.

Epson Users of San Francisco Bay Area Epson group has nationally circulated newsletter Valnews: 400 members mostly QX-10 owners, growing software library. Meetings focus on mutual support. Mainly Valdocs and other applications. Meetings first Thursdays. 7 p.m. Fort Mason Center, Bldg. C, Room 205, San Francisco. Contact Alan Magary, 904 Irving St., Suite 271, San Francisco CA 94122, (415) 661-9270.

Napa Valley Epson Users Group 1307 Hestia Way, Napa, CA 94558, (707) 253-8727.

FORTH

FORTH Interest Group, Berkeley Chapter. Meets 2nd Saturday of the month at 1 pm, 10 Evans Hall, UC Berkeley. Contact Mike Perry, (415) 644-3421.

FORTH Interest Group, Monterey/Salinas Chapter. Contact Bud Devins, (408) 633-3253.

FORTH Interest Group, Sacramento Chapter. Meets 2nd Tuesday of the month, 7 pm, 170B 59th St., Room C. Contact Tom Ghormley (916) 444-7775.

FORTH Interest Group, Bay Area Chapter. Meets 4th Saturday of the month, 10 am advanced, 1 pm beginning, at ABC Christian School Auditorium, Dartmouth and San Carlos Ave., San Carlos (408) 277-0668.

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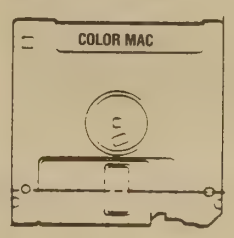

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ton chapter. Contact Doug Dillon (209) 931-2448.

GAVILAN

Gavilan User Group. Meets 2nd Thursday, 7 pm, Lockheed Bldg 162. Contact R.W. Brown, 780 Manx Ave., Campbell, CA, (408) 379-2774. Gavilan BBS (408) 374-3974, 300/1200, 24 hours, free.

HEATHKIT

San Jose Heathkit Users Group. Meets first Wednesday at 7 pm at the Heathkit store on South Bascom Ave. in Campbell.

B.A.H.U.G. Bay Area Heath Users. Heath/Zenith computers, ZDOS, PC-DOS, CP/M and MS-DOS. Meetings at 2001 Middlefield Rd., Redwood City, CA, 7 pm, 2nd Tuesday of each month.

NBHZUG North Bay Heath/Zenith Users Group. Devoted to Heath/Zenith computers in specific and MS-DOS, CP/M computers in general. Beginners and advanced. Meeting place varies, time 2nd Saturday, noon. Contact Martin Schaaf, (415) 454-6761 for information.

HEWLETT-PACKARD

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INTEREX is the International Association of Hewlett-Packard Computer Users, with affiliated users worldwide approaching 10,000. Acting as an information resource for users of HP computers (HP3000, 1000, 900 and Series 100), INTEREX maintains libraries of user contributed software. The software is available through the CSL membership categories. INTEREX has three publications, one or two for each of the categories. Phone (408) 738-4848 or write User Services Department, 680 Almanor Ave., Sunnyvale, CA 94086.

IBM

South County PC Users Group Meetings held second Thursday of each month at St. Clements School Library, 730 Calhoun St., Hayward. Public Domain and shareware disks, newsletter. Contact Bob McCloud (415) 537-9899.

Silicon Valley Computer Society. New users SIG, 7:30 pm, 2nd Wednesday; call Dick Meyer, (408) 723-0159. dBASE III SIG, 7:30 pm, 4th Thursday; call Thaine and Barbara Anderson, (415) 345-0152. WordPerfect SIG 7:30 pm, date variable; call Martin Van Derpool, (408) 238-8434. Software tools and graphics SIG, 7:30 pm, 4th Tuesdays; call Hal Sampson, (408) 866-7833. Artificial Intelligence SIG, 7:30 pm, 2nd Thursdays; call Kent Byron, (415) 656-0410. Telecom SIG, 7:30 pm, 1st Monday; call Scott Sawicki, (408) 243-8781. Lotus 1-2-3/Symphony SIG, 7:30 pm, 3rd Thursday; call Bill Welch, (408) 247-3405. C programming SIG, 7 pm, 3rd Tuesday; call Fletcher Johnson, (408) 946-0960.

California PC LAN Users Group, 1625 The Alameda, Suite 511, San Jose, CA 95126. (408) 289-1711.

Diablo Valley PC. An IBM PC User Group, monthly meetings, newsletter and public domain software library. Contact Jim McDonnel, president, 2261 North Main St. 117, Walnut Creek, CA 94596, (415) 933-1270.

The Bay Area Computer Society Emphasis on IBM PCs, networking and multi-user systems. P.O. Box 20583, Oakland, CA 94604, (415) 839-5786.

IBM PC Users Group of the Redwoods. Anyone interested in PCs and/or compatibles is welcome. Meetings at Yulupa School, 2250 Mesquite Dr., Santa Rosa, CA, 4th Thursday of the month, 7 pm. Contact Michael Adams, P.O. Box 5055, Santa Rosa, CA 95402, (707) 664-8320, (707) 546-3619.

Sacramento PC Users Group. Over 1000 members. Meetings at Holiday Inn Holidome, 5321 Date Ave., 7 pm, 3rd Wednesday. Contact Barney McCauley, P.O. Box 685, Citrus Heights, CA 95610, (916) 484-1048, or call the club number (916) 332-1944.

SF PC jr User Group meets monthly. Lectures and discussions on the usage of IBM PC jr software and hardware. Software and books library. For more information please send SASE to 2336 Market St., Suite 20, San Francisco, CA 94114. Meetings at 1550 Bay St., SF, every first Sunday at 7:30 pm.

San Francisco PC Users Group. Largest SF group focusing on IBM and compatibles. Over 150 disks of public domain software, excellent monthly newsletter. 800+ members, $30 yr. Write 3145 Geary Box 155, San Francisco, CA 94118. Meetings 8 pm, 3rd Mondays, Bldg A Fort Mason.

Monterey Bay PCjr Users Group. Meets at Legacy Computers, 431 Tyler, Monterey, CA 93940. Usually meets second Thursday of the month. Contact Lloyd Reece, (408) 899-5795. Mail to Box 1191, Seaside, CA 93955.

Valley PC Users Group. Individuals and corporate users of the IBM PC and compatibles; guest speakers from major vendors, public domain software, exchange problems and solutions. BBS 24 hours (209) 952-5021. Meeting address 731 Brookside Road, UOP School of Pharmacy, Rotunda Bldg., Stockton, 7 pm, 1st Tuesday. Contact Francis Pillow, P.O. Box 77748, Stockton, CA 95207, (209) 478-9697.

FUNHUG PC—Fremont, Union City, Newark, Hayward User Group. For recreational/home users of IBM PC and compatibles. We meet on the third Wednesday of each month at the Fremont Main Library, 39770 Paseo Padre, Fremont, CA at 7:30 pm. We have software/hardware demonstrations and visits from manufacturers. Our library contains over 350 disks of public domain software. There are no dues, beginners are always welcome. For more info and map send SASE to Russ Fisher, 36015 Pizarro Dr., Fremont, CA 94536.

Marin-Sonoma PC Users Group. Meets last Tuesday of the month, 7:30 pm, in the Whistlestop building, 930 Tamalpais St., San Rafael, CA. Park in Savings and Loan parking lot across the street. Classes, SIGs, 24 hour BBS at 415/927-1216. Emphasis on business applications and solutions. For additional information contact John Hawkins (415) 525-8500, P.O. Box 6476, San Rafael, CA 94903.

Santa Cruz Computer Society. An IBM PC and compatible for beginning to advanced users, programmers and decision makers. Meetings 3rd Thursday, 7 pm, 1555 Soquel Dr., Santa Cruz (Dominican Education Center). Call Daniel Payne, (408) 476-0203.

San Francisco Computer Society, a CP/M and MS-DOS user group, meets on the first Monday of each month, 7:00 pm, at Homestead Savings, 5757 Geary Blvd., San Francisco. Membership is free, meetings are free and open to members and non-members. Member of FOG. For more information call Ralph Gallagher at (415) 929-0252.

IBM Compatible User Group of Silicon Valley. Meets monthly to share information about IBM compatible or clone computers. BBS (408)287-8326, 300/1200, 5:30 pm-7:30 am M-F, 24 hours weekends. Call (408) 287-8325 for information, or write to 1515 The Alameda, Suite 303, San Jose, CA 95126.

Microcomputer Users Of Santa Cruz (MUSC). A FOG affiliate, membership open to all persons interested in MS-DOS or CP/M computers. Meetings the second Tuesday of each month. Wheelchair access. Guest speakers, demonstrations, MS-DOS and CP/M software libraries. Info: Barney Bricmont. 1920 Maciel Avenue, Santa Cruz, CA 94062. (408) 476-0504.

Berkeley P.C. Users Group. Meets on the 2nd Monday of each month, 7:00 pm, at 2618 Telegraph Avenue, Berkeley. For more info, contact Mel Mann, 1145 Walnut Street, Berkeley, CA 94707, (415) 527-2177 or Andy Wong, 2618 Telegraph Ave., Berkeley, CA (415) 845-4814.

IBM AT/XT Clone Users Group. Meets 2nd Monday of every month at Bldg. 'C' (usually room 215) Fort Mason Center in San Francisco. $25 annual membership includes newsletter. Group focuses on clone hardware and support. P.O. Box 15000/324, San Francisco, CA 94115. Voice: (415) 861-9321. BBS: (415) 552-9070.

Mid-Peninsula IBM PC Club. For IBM employees only. Contact George Halle (415) 855-3474 or Scott Maiden (415) 855-3038.

SACTO PCjr Group. Meets on the 4th Tuesday of each month at SMUD Bldg., 59th and Folsom Blvd., Sacramento, at 7:15pm.

CADVANTAGE - Cadvance Users Group. Meets at Mitchell Park Community Center, 300 Middlefield Road, Palo Alto. 7/22/87, 10/21/87, 1/20/88, 7:00pm to 10:00pm. PC CADD for architectural/facility designers. Current users and/or those contemplating CADD are welcome. Meetings take place once every quarter.

BAYPUG-Bay Area P-CAD Users Group. Meets P-CAD 1290 Parkmoor, San Jose. 7/30/87, 10/29/87, 1/28/88, 9:00am to 1:00pm. PC CADD for PCB/CAE Designers. Current users and/or those contemplating CADD are welcome. Meetings take place once every quarter.

The Blacksmiths-ANVIL 1000 MD Users. Meets at Mitchell Park Community Center, 300 Middlefield Road, Palo Alto. 7/15/87, 10/14/87, 1/13/88, 7:00pm to 10:00pm. PC CADD for Mechanical Drafting and Engineering designers. Current users and/or those contemplating CADD are welcome. Meetings take place once every quarter.

KAYPRO

BAKUP (Bay Area Kaypro Users and Programmers). One of largest Kaypro user groups in country. Meet 3rd Tuesday of month, 7:30 pm. We support our RBBS/RCPM for members, publish a monthly newsletter, have a 40 volume software library, and a lot of fellow KP'ers! Write for info, $10 per year to join: Membership Coordinator, P.O. Box 20181, Oakland, CA 94620.

KAYFUN Peninsula Kaypro Users Group meets second Thursday of every month at 7:30 pm in the ground floor social room, 222 Laurel St., San Carlos. Bimonthly newsletter, public domain software library, and publication library. Membership $12 per year. Every third meeting a Free Forum night dedicated to individual help. Contact Larry Welling, 222 Laurel St. #310, San Carlos, CA 94070, (415) 593-9981.

South Bay Kaypro Users Group (SBKUG). Meetings at 10400 Torre Ave., Cupertino. We have an extensive library of public domain software, including over 200 diskettes of the SIG/M library. The floor is open for questions at each meeting, and we welcome new members at all levels of ability. Bring your machine, or at least your diskettes. For meeting night call Chuck Hansen at (408) 257-5244, or write P.O. Box 390088, Mountain View, CA 94039-0088.

HAYPROS. Kaypro User's Group—informal format, dealer supported. Meets at Computer Insights, 40957 Grimmer Blvd., Fremont, CA 94538, 1st Tuesday each month. Contact Ted de Castro, 18841 Vineyard Rd., Castro Valley, CA, (415) 581-8882.

Microcomputer Users Of Santa Cruz (MUSC). A FOG affiliate, membership open to all persons interested in MS-DOS or CP/M computers. Meetings the second Tuesday of each month. Wheelchair access. Guest speakers, demonstrations, MS-DOS and CP/M software libraries. Info: Barney Bricmont. 1920

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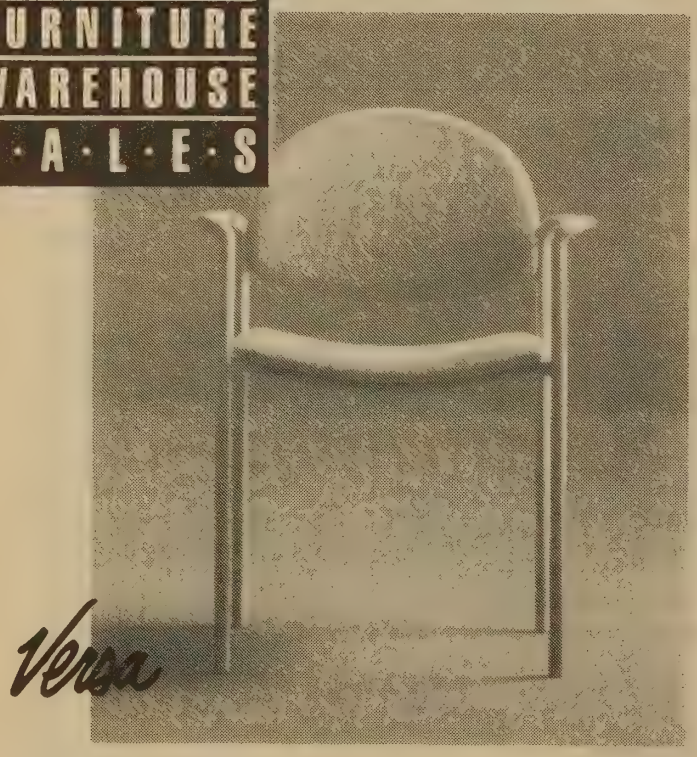

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San Francisco Computer Society, a CP/M and MS-DOS user group, meets on the first Monday of each month, 7:00 pm, at Homestead Savings, 5757 Geary Blvd., San Francisco. Membership is free, meetings are free and open to members and non-members. Member of FOG. For more information call Ralph Gallagher at (415) 929-0252.

Silicon Valley FOG. Supporting all types of CP/M micros. Two meetings monthly, one at the Campbell Public Library, 70 North Central Ave., Campbell, and the other at the Saratoga Community Library, 13650 Saratoga Ave., on the southeast corner of Saratoga and Fruitvale Avenues, Saratoga. Call (408) 371-8699 for further information.

LEADING EDGE

Bay Area Leading Edge User Group. Interested in starting a Leading Edge User Group? Write to Jim Williams, 26765 Calaroga Ave., Hayward, CA 94545.

MACINTOSH

EBMUG (East Bay Macintosh User's Group) Friendly, informal. Public domain software and computer book library. Information exchange. Speakers. Product discounts. Free admission. Meets at West Berkeley Public Library, 1125 University Ave., Berkeley, CA, third Tuesday of each month at 7:30 pm. Contact Shep Tamler at P.O. Box 7816, Berkeley, CA 94707-0816.

Bay Area MacForum New and experienced Macintosh users. 2 monthly meetings, one in conjunction with San Francisco Apple Core, and one in Concord. For meeting and current events information call (415) 771-5830. Recorded message 24-hours, live person sometimes during business hours. Leave name and address to receive information.

Berkeley Macintosh User Group (BMUG). 1442A Walnut St., #62, Berkeley, CA 94709. General meetings: every Thursday 6 pm, Physical Sciences Lecture Hall on UCB campus. SIG meetings on Mondays, Tuesdays and Wednesdays. Call for more info and this week's topic. (415) 849-9114. BBS (415) 849-BMUG.

MacNexus. Sacramento's Macintosh User Group. 150 members, but still informal. Extensive public domain collection. Contact Gail McGovern, P.O. Box 163058, Sacramento, CA 95816, (916) 446-2411. Meetings 3rd Thursdays, 6:30 pm, Almond Plaza, 17th & C, Sacramento.

MacProgram Unlimited. Meets monthly. Informal with hands-on testing of different programs. Public domain and standard programs in rental library. Meets Albany YWCA, Kains and Solano, Saturday 9:30 am. Contact William Gong, P.O. Box 7704, Berkeley, CA 94707. (415) 527-1756.

Stanford Macintosh Users Group (SMUG) meets on the first Monday of the month at 7 pm in Kresge Auditorium, Stanford Campus. Meetings include speakers, discussions, answers and sale of library disks and other SMUG items. The Excel, Novice, Developer's, Japanese Word Processing Groups each meet twice monthly. SMUG publishes a newsletter and runs a BBS. Call the SMUG hotline at (415) 723-SMUK for a listing of current events. Stanford Macintosh Users Group, P.O. Box 2354, Stanford, CA 94305-0135.

Club Mac of Monterey. Macintosh User Group of Monterey Bay Area. Membership with monthly newsletter $25. Meetings 7 pm, last Wednesday of the month, Santa Catalina School, Monterey. Contact Richard Ware, P.O. Box 222988, Carmel, CA 93922.

Macs Of Marin. Macintosh users of Marin County. Both beginning and experienced users are welcome. Meetings: Room 104, Austin Science Building, College of Marin, 2nd Thursday of each month, 7:00 pm. Contact Steve Salzman, (415) 459-5707.

maCruzers, a Macintosh user's group, meets every second Wednesday of the month at Louden Nelson Recreation Center in Santa Cruz, 7 pm. For information call (408) 459-1644, or leave mail on The WELL (415-332-6106) for Paul Foraker [sforaker]. Wood Ring BBS (408) 423-7205, 18 hrs/day, several megs of shareware/pd utilities and games; making the effort to have the latest version of important DAs and utilities.

Association of Apple 32 Users. Meetings at GTE in Mountain View, 2nd Saturday of the month. Contact Ken Silverman, P.O. Box 634, Santa Clara, CA 95052, (408) 263-0398.

BAMMSBUA: (San Francisco) Bay Area Mac M.S. Basic Users Anonymous. A high-level users group devoted to the Microsoft dialect of BASIC for the Macintosh. For more information contact Ted Jones (415) 826-9239.

Mac Health User Group. For DentalMac, Medimac and Chiromac users, and interested others. To discuss ways to better use these billing and accounts receivable programs and the Macintosh in healthcare practice. Meets at various times and locations. For more info, contact Robin Guess, 896 24th Avenue, San Francisco, CA 94121, (415) 387-3042.

Hellmans Open House. Meets every Tuesday 7 pm at 814 "E" St. San Rafael. Macintosh Network Games, Mazeware and Net-Trek, Bring your Mac and Appletalk cables if you have them. For more info call (415) 453-7924.

Silicon Valley Christian Mac Users Group. Meets 1st Thursday of each month at 7 pm at various locations. All Bay Area Christian Mac users invited. Informal, just getting started, monthly newsletter and hot lines. Contact Rick Thrasher 2190 Bristolwood Ln., San Jose, CA 95132. (408) 945-4946.

MICROMATE

East Bay Micro-Mate Users' Group. CP/M (3.0) public domain software available. Meetings at 757 Longridge Rd., Oakland, 1st Thursday of each month. Contact Ed Miler, P.O.B. 402, Moraga, CA, 94556, or call (415) 376-1611 for info.

MICROPRO

Wordstar Users. Forming user group for Wordstar users. Please write to P.O. Box 1331, Menlo Park, CA 94025 or call (415) 325-4277.

MIDI

MIDI Applications Group. Meets first Saturdays of the month. Contact John Komlenic, 1411 10th Ave., Oakland, CA 94606, (415) 465-6216.

MORROW

BAMDUA (Bay Area Micro Decision Users Association). Meets on last Tuesday of the month, 7:30 pm. Call (415) 644-2805 for location. Monthly newsletter.

SMUG (Stanford Morrow Users Group). Meets 2nd Wednesday of each month at 7 pm on Stanford Campus, Shultz Auditorium, Health Research and Policy building, Campus and Lomita Drive. Other CP/M users welcome. For further information call Ross E. Voyles, (408) 243-1455.

Microcomputer Users Of Santa Cruz (MUSC). A FOG affiliate, membership open to all persons interested in MS-DOS or CP/M computers. Meetings the second Tuesday of each month. Wheelchair access. Guest speakers, demonstrations, MS-DOS and CP/M software libraries. Info: Barney Bricmont. 1920 Maciel Avenue, Santa Cruz, CA 94062. (408) 476-0504.

PETMUG — Petaluma Morrow Users Group. Meets Westamerica Bank, Washington Square, Petaluma, 7:30 pm, 4th Thursday of the month. Contact Frank Nance, president, 293 Circulo Puebla, Rohnert Park, CA, (707) 585-2980.

San Francisco Computer Society, a CP/M and MS-DOS user group, meets on the first Monday of each month, 7:00 pm, at Homestead Savings, 5757 Geary Blvd., San Francisco. Membership is free, meetings are free and open to members and non-members. Member of FOG. For more information call Ralph Gallagher at (415) 929-0252.

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NEC

Bay Area NEC/100 Users. For NEC 8201A and TRS-80 Model 100. Meets College of Alameda, 1st and 3rd Thursdays, 7:30 pm. Contact Rachel Holmen, c/o Truly Portable, Box 2916, Oakland, CA 94609, (415) 658-1889. Call for room number, which changes occasionally.

NORTHSTAR

INSUA Largest North Star users group in the world. Members' newsletter and software library. Membership dues $20. Contact George Riddle, P.O. Box 2910, Fairfield, CA 94533.

OSBORNE

East Bay FOG (First Osborne Group) Osborne, Kaypro and Morrow. Meets second Wednesday of the month at B&B Electric, 2832 Ford Street, Oakland. 6 pm workshops, 7:30 pm program. For info contact 5497 Taft Ave., Oakland, CA 94518; phone (415) 272-9099.

SMOG3 Osborne User Group (Peninsula) Meets first and second Monday of every month at Crane Place, 1331 Crane, Menlo Park. Call Phil Moore at (415) 325-2442.

MTDOG (Mt. Diablo Chapter-First Osborne Group) Meetings 7 pm, 3rd Wednesday each month in Diablo Room (top floor), SF Federal Savings and Loan, 1660 Olympic Blvd. (cross-street: California), Walnut Creek. Software library, software / hardware / service demonstrations, sharing problems and solutions. For meeting info contact Larry Sydes, (415) 933-2665.

North Bay First Osborne Group. Meets first Thursday of the month at 7:30 pm, Valley Oaks Apts. Rec. Hall, 2600 Northcoast St., Santa Rosa, CA (off West Steele Lane). Call (707) 546-0145 for more information.

Microcomputer Users Of Santa Cruz (MUSC). A FOG affiliate, membership open to all persons interested in MS-DOS or CP/M computers. Meetings the second Tuesday of each month. Wheelchair access. Guest speakers, demonstrations, MS-DOS and CP/M software libraries. Info: Barney Bricmont. 1920 Maciel Avenue, Santa Cruz, CA 94062. (408) 476-0504.

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PICK

Northern California Pick Users. NCPU mails a monthly newsletter, meets on the third Tuesday of the month for a dinner meeting with Pick related program, holds Pick educational courses, and has many other member benefits. P.O. Box 884474, San Francisco, CA 94188-4474, (415) 284-4063.

PIED PIPER

Pied Piper Users Group Owners of Pied Piper CP/M based computer are invited to call or attend the PPUG. Meets last Tuesday of the month at 7:30 pm. Please call (415) 638-1146. Meeting address: 10950 Elvessa St., Oakland 94605.

PROLOG

Prolog. A SIG-Prolog is being formed. Interested? Call Jorge (415) 969-5045 or Dave (415) 368-8450 (evenings).

R2E

North Bay R2E Forming user group for R2E System microcomputer users. Please call (415) 235-1598 for information.

RADIO SHACK TRS

TRS-80 Computer Society of Diablo Valley The purpose of this group is the sharing of information, problem solving, support group, purchasing discounts, support for professional, business and educational users of Radio Shack computers. Out-of-area members welcome. Meetings second Tuesdays of the month, Willow Creek Center, 1026 Mohr Lane, Concord, 7:30-9:30 pm. Doors open at 7. Contact Roy or Sue Copeland, P.O. Box 23438, Pleasant Hill, CA 94523, (415) 372-7003.

TRS Nybblers. All Tandy computers including MS-DOS (IBM Compatibles). SIG's include laptops, CoCo's, Mod 1,3,4, Mod 2, 12, 16, 6000 and MS-DOS, Access to a variety of Public Domain software. Education modules, "problem solving" peripheral committee. Meets at Chabot College (Rooms 600 & 1564) 2nd Friday, 8 pm. Write TRS-Nybblers, Chabot College, 25555 Hesperian Blvd., Hayward, CA 94545. Attn Mel Edwards. Call B.B. Jarvis (415) 846-3575.

Bay Area Chapter of the California Computer Federation, a user group for Color Computer users formed by The Redwood Color Board. Write the R.C.B., P.O. Box 7007, Redwood City, CA 94063 for details.

South Bay TRS 80 Users Group (SBUG). For info write P.O. Box 60116, Sunnyvale, CA 94088 or call Don Rhodes at (408) 996-1008. BBS: (408) 253-6293. Meetings, Cupertino library, 3rd Tues., 7:15 pm.

San Mateo TRS-80 Users Group. Meets 4th Thursday of the month at Cal Fed S&L, 2600 Ocean Ave., SF., 7:30 pm. BBS (415) 574-7684, 300/1200, 8-N-1 settings. Contact Julian Kaufman, (415) 992-1783.

Bay Area NEC/100 Users. For NEC 8201A and TRS-80 Model 100. Meets College of Alameda, 1st and 3rd Thursdays, 7:30 pm. Contact Rachel Holmen, c/o Truly Portable, Box 2916, Oakland, CA 94609, (415) 658-1889. Call for room number, which changes occasionally.

Byte Bandits of America. Meets 2nd Saturdays 1 pm, 4th Wednesday 7 pm, 780 Manx Ave., Campbell, CA. Call Robert W. Brown, (408) 379-2774 for information. BBS: 300/1200. 24 hrs., free, (408) 374-3974.

Club 100. A Model 100 users Group. Dedicated to Model 100, 103, 200, NEC 8201A and Olivetti M10 users. Contact Richard Hanson, club secretary, P.O. Box 23438, Pleasant Hill, CA 94523, or call our club BBS at (415) 939-1246. We are a very active, on-line club with many helpful members, and a large Model 100 public domain library available to members.

United Computer Federation: San Francisco Chapter. Meets the fourth Tuesday of each month at the Foster City Fashion Island Mall community room. Meeting starts at 7:30 pm. Meetings are open to the public and all are welcome. The UCF is a network of Tandy color Computer user groups. For more information phone Brad Ryan, Chapter Vice President, at (415) 469-3172.

REALWORLD

Bay Area REALWORLD Users Group meets the third Tuesday of each month. For more information contact Mitch Paioff, 5097 Tisdale Way, San Jose, CA 95130, (408) 866-4310.

ROYAL

Royal Alphatronic, San Francisco. New group forming. Call Tom Rutkowski at (415) 863-4794 for information or write P.O. Box 421161, San Francisco, CA 94142.

S-100

S-100 Bus Users Group. Meets fourth Tuesdays, 7:30 pm, Community Room, El Paseo de Saratoga, San Jose. Contact Dick Delp, Box 10404, San Jose, CA 95157, (408) 245-2137. CP/M-80, S-100 emphasis. CP/M and MS-DOS libraries.

SANYO

Sanyo MBC 1100-1150 user group now forming in Oakland. Call or write (415) 534-1981, 5885 Bancroft Ave., Oakland 94605 for meeting time and location.

Sanyo National Users Group. SNUG is a central resource for Sanyo information and public domain. Inquiries welcome! Contact John Egan, 101 Irving Ct., Pleasant Hill, (415) 827-3023.

Sanyo PC Compatible Club. SPCCC supports Sanyo 16 bit machines and similar PC clones. We publish the Sanyo PC Hackers Newsletter (International), subscription rate $20/yr., and maintain a public domain software library. Meeting at the Mercury Room of Mercury Savings & Loan, 99 El Camino Real, Menlo Park, CA, 7-9 pm the first Wednesday of the month. Contact Victor R. Frank, 12450 Skyline Blvd., Woodside, CA 94602, (415) 851-7031.

SOUTHERN PACIFIC

ICOLATUG. User group for owners of Southern Pacific Ltd's Mountainside ICO and LAT single board computers. Exchange tips and programs. Contact Andrew P. Porter, 774 Joyce St., Livermore, CA 94550.

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South Bay T.I. User Group. One general meeting per month. We have training session, library and own bulletin board (408) 578-6264. Meets first Thursday of each month at 7:00 pm, Cupertino Library, 10400 Torre Ave., Cupertino, (between DeAnza Blvd. and Rodriques Ave.) starting at 7 pm in the basement conference room. Call v.p. Keith Felix, (408) 258-6678.

Nor-Cal TI 99/4A Users Group. Learn more about your Texas Instruments 99/4A computer. Free software, sources of hardware and software. Contact Dave Steady, 324 Howard St., Petaluma 94952, (707) 762-6561. Meetings at Retail Clerks' Union Hall, 382 Tesconi Ct., Santa Rosa, CA, first Wednesday of the month at 7 pm.

Santa Clara Valley TI Pro User Group. Meetings 7 pm, 4th Thursdays, location varies. Contact Tom Schoen, PO Box 871, Newark, CA 94560, (415) 793-6670.

THEOS/OASIS

Theos/Oasis Users Bay Area Group. Greater SF Bay Area users of THEOS and OASIS multi-user operating systems meet quarterly to focus on "hot" issues and share info. Contact Joe Trimble, 236 Frisbie St., Oakland, CA 94611, (415) 839-3281.

TIMEX/SINCLAIR

East Bay Timex/Sinclair User Group (EBZUG) Timex/Sinclair user group. S/W library and newsletter. Usually meets 4th Thursday of the month at 7:30 pm, CALL FIRST FOR EXACT TIME AND PLACE. Contact Russ English, 415/465-3116 or write to Woody McPheeters at 3128 King St., Berkeley, CA 94703.

Timex/Sinclair Users of Silicon Valley (GUTS/SV) c/o Bill Miller, 6675 Clifford Drive, Cupertino, CA 95014-4530. 253-3175. SW library and newsletter. Meets every Saturday morning at 9:00 am at Stanford University, Jordan Hall (in the quadrangle), Math Building (number 380) in room 380C (downstairs). For topic check the PDSE (Public Domain Software Exchange) BBS in Sunnyvale at (408) 735-7390, 300/1200, 8-N-1, 24-hours, 32 lines (no waiting!).

Silicon Valley Timex/Sinclair User Group (SVTSUG) Timex/Sinclair user group: 6675 Clifford Drive, Cupertino, CA 95014-4530. Bill Miller (408) 253-3175. SW library and newsletter. Meets at Cupertino Library, 10400 Torre Ave., Cupertino, CA, last Tuesday of the month.

UNIX

The Unix C-Club Seminars, public domain softwares, information exchange, Unix hardwares and softwares. Discount on purchases. Meets 2nd Saturday of each month at 10 am. Call Gilbert B. Dalit at (415) 348-6723 or (408) 238-5587 for more information, or write: 122 2nd Ave., Suite 214, San Mateo, CA 94401.

VECTOR

Bay Area Vector Group Meeting held regularly. Please call to be put on mailing list. You will be informed of next meeting! Contact Peter Tjeerdsma, 764 Cole St. #4, San Francisco, CA 94117. Phone (415) 681-0308.

VICTOR

Victor* Group is the San Francisco Bay Area Victor User's Group. We have three chapters East Bay, South Bay, and San Francisco. Members can attend meetings at any of the chapters or all of them. The more the merrier. Dues are $30 a year, which includes a subscription to VictorTalk, membership in a Victor-exclusive discount buying cooperative, and the right to buy from our public domain library at a discount. South Bay meetings are held the first Thursday of each month at Computer Insights, 40957 Grimmer Blvd., Fremont at 7:30 pm. Contact John Kimber (415) 797-6423. East Bay meetings are held the second Wednesday of the month at 7:30 pm; contact Boardman Moore (415) 283-3285 for location and further info. San Francisco meetings are held the third Sunday of the month at 5 pm at Homestead Savings, 130 West Portal, San Francisco. Contact Joe Zmuda, (415) 584-4048.

VTC-1050

VTC-1050 User's Group. Establishing a VTC-1050 User's group and newsletter. Interested parties please call or write Ken Phillips, 4349 Blackford Ave. #1, San Jose, CA 95129, (408) 973-1353.

WORD PERFECT

Word Perfect of Santa Cruz. Now a SIG of Santa Cruz Computer Society. Telephone network, meetings occasionally as needed. 2120-87 N. Pacific, Santa Cruz, CA 95960-2743. Contact Sylvia Caras, (408) 426-7636.

South Bay Word Perfect User Group. Call Martin Van Derpool, (408)238-8434 for information.

ZENITH

Zenith User Group of San Francisco. Zenith users are forming a user group and bulletin board for Zenith computers. Hands on demonstrations will be provided on the full line of Zenith hardware. Meetings at 1325 Howard St., SF, CA. Contact Stan Kelley, 415-861-3068.

B.A.H.U.G. Bay Area Heath Users. Heath/Zenith computers, ZDOS, PC-DOS, CP/M and MS-DOS. Meetings at 2001 Middlefield Rd., Redwood City, CA, 7 pm second Tuesday of each month.

NBHZUG North Bay Heath/Zenith Users Group. Devoted to Heath/Zenith computers in specific and MS-DOS, CP/M computers in general. Beginners and advanced. Meeting place varies, time 2nd Saturday, noon. Contact Martin Schaaf, (415) 454-6761 for information.

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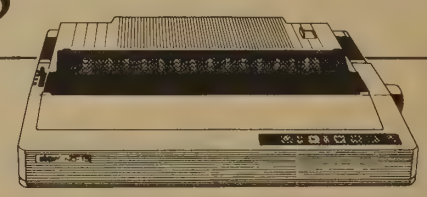

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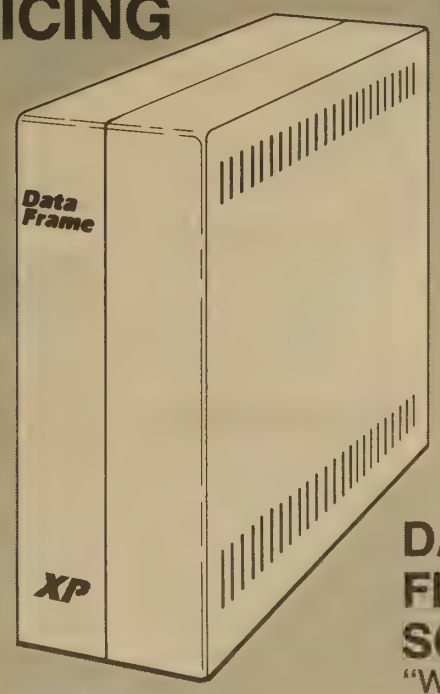

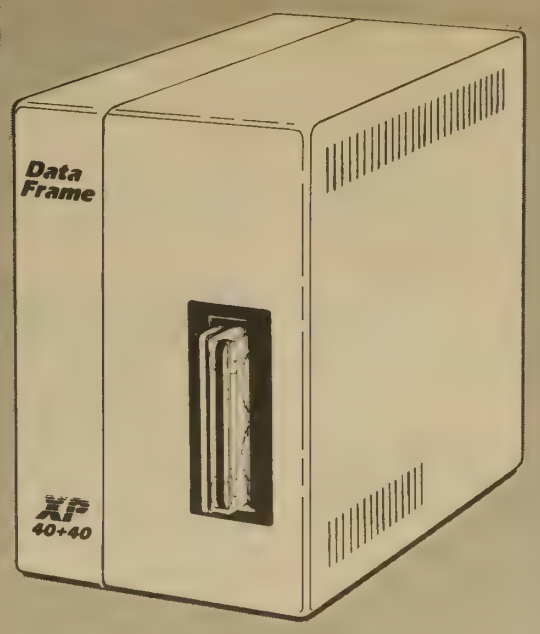

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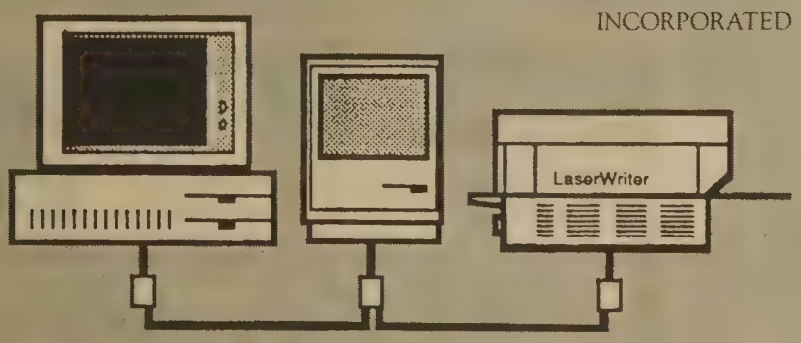

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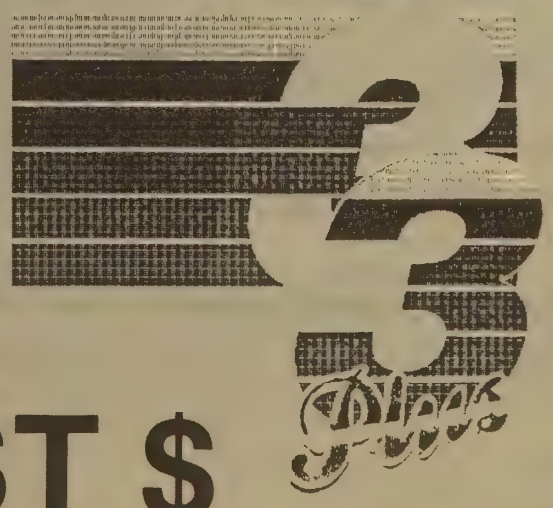

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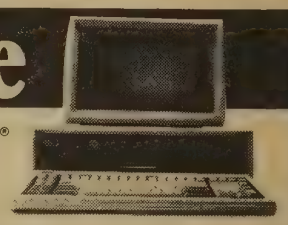

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Newsbytes From COMDEX

By Dana Blankenhorn

Tariffs—Everybody's Avoiding Them

President Reagan announced 100% punitive tariffs against Japanese micros in March, but you'd never know it. Some companies, like Toshiba, have taken prices up $1-200, but instead of talking about that, they're talking about a new 1100 portable with an 80C88 chip they've got for $1,200. The 80C88 has an 8-bit system bus, and the tariff covers only the more sophisticated machines with a 16-bit bus. NEC and Mitsubishi have found another way around the tariff—by assembling their computers here in the U.S., they avoid the whole problem. All of which had tariff supporters like Bruce Walter of Grid Systems Inc., (Dallas, TX) scratching their heads.

IBM And PS/2

IBM has replaced Charlie Chaplin with a routine stage show called "The Turning Point," featuring a man and a woman discussing the new PS/2 line—she's the one with the answers. All four machines are on display, (although not all of them are shipping yet) and all IBM salesmen wear headsets which they plug into a hidden speaker system for demonstrations. Featured are IBM's software-hardware "Solution Pacs," such as one for desktop publishing, due for release in August. OS/2 still won't ship until the end of the year, we were told, but an early, demonstration version was on display. So was the new DOS 3.30. The booth was cut off by walls into sections for individual PS/2 models, software, and to answer questions from dealers. (This last was usually empty.)

The new PS/2s represent more than lower-cost manufacturing. They also put "Big Blue" into niches previously mined only by Apple, Atari and Commodore. Like music. A Model 30 with an IBM add-in card was attached to a Yamaha DX-7 synthesizer, and an IBM employee named Jeff Dibley played "Chattanooga Choo-Choo" and other tunes, with the Model 30 screen giving a complete read-out on all elements of the performance.

Amiga Makes A Big Splash

Once again Commodore featured product developers in its booth, but now the names are more established. WordPerfect, for instance, was showing versions of its best-selling word processing programs under both Amiga DOS and PC-DOS. (The Amiga runs an older version, 4.1 of the program, but it supports multi-tasking under Amiga DOS.) *WordPerfect Executive* ran fine under PC-DOS with 5¼ inch disks.

Digi-View, from NewTek in Topeka, Kansas, was described to me as "the best thing in the show," and maybe it is. It's an image capturing system for the Amiga, which works with any TV camera. To show off the product, Newtek pointed a TV camera at one of their employees and had her say a few words. Then they loaded the tape onto an Amiga and began to play with it—sort of a "Maxine Headroom". It certainly drew a crowd.

Want to make an interactive video program on your very own desktop? You can, thanks to Spafax Inc., a British developer exhibiting in the Commodore Amiga booth. Executive Vice President Robert P. Clarke said the National Geographic Society has already begun using a Spafax system to put all their photos on disk and index them. Spafax stores up to 55,000 still frames, or 30 minutes of full-motion TV, on a single 12-inch Laserdisk, and the whole system costs only about $6,000, using the Amiga 2000 as the computing platform and a Sony Laserdisk player. Both teaching and archival storage of TV-based information are now possible on the Spafax system. CONTACT: Robert P. Clarke, Spafax, (404) 984-2810.

Even without proper support, developers keep coming up with neat stuff for the Amiga.

For instance, how about four-color separations, output to a Linotronic typesetter, right off a desktop? Gold Disk, a small outfit out of Missassauga, Ontario, has it in The Professional Page, a $395 product due to ship at the end of July. The only practical limit on output size is the output device—the software can run documents up to 17″×17″. Of course, it supports PostScript. For those with lower budgets, the same company publishes *PageSetter*, which can output to a dot matrix printer ($150) and *LaserScript* ($45), which offers PostScript support for *PageSetter* users.

Right next to Gold Disk was Richard W. Brown of Brown-Wagh Publishing, Los Gatos, CA, showing *Publisher 1000*, another Amiga desktop publishing program which will support both the H-P LaserJet and PostScript Standards at $200. Brown promised to send new drivers for both printers to anyone who buys his product off-the-shelf and sends in the warranty card. Free, he said. CONTACT: GOLD DISK, P.O. Box 789, Streetsville, Mississauga, Ontario, CANADA, L5M 2C2 (416) 828-0913; Richard W. Brown, BROWN-WAGH PUBLISHING, 16795 Lark Ave., Suite 210, Los Gatos, CA 95030 (408) 395-3838

The Merging Of Laptop And Desktop

That's the idea behind *WordPerfect Executive*, an integrated package on a 3½″ disk which works equally well on PC-compatible laptops or desktops. It has word processing, a spreadsheet, *Sidekick*-like utilities and a user-friendly shell, all on one 720K disk. (You can also get it on the old 5¼″ format, but it takes two disks.) "All the resident modules can be resident on a 640K machine," noted WordPerfect press spokesman Jeff Acerson. Thus the new standard: 640K, 3½″ disks, one machine for both the plane and the office. (Nice.) Price: $249.

For WordPerfect followers, the company also renamed its other products (*MathPlan* becomes *PlanPerfect*) and beefed up its phone-in support. "Our goal is you won't be on hold for more than two minutes, and we're going to have toll-free 800-line support for all our products," said executive vice president Pete Peterson. If you're one of their customers, check it out by calling 1-800-321-5906. CONTACT: Jeff Acerson, WordPerfect Corp., (801)227-4010.

The Koreans Are Here In Force...

Japanese firms are dominating this show, but they're not taking much pleasure in it. Instead, they're looking over their shoulders at the Koreans. They're here in force. Samsung, Hyundai, and Goldstar all have large booths offering a full line of IBM-compatibles and components. So does Hyosung. And Daewoo is here demonstrating its hold over Cordata, with machines sporting AT&T 6300 compatibility at a very, very low price.

For those keeping score, Samsung and Hyundai seem the most ambitious. Hyundai, which entered the market through Blue Chip Electronics of Chandler, AZ, now calls Blue Chip merely "a dealer." They're looking for new dealers, distributors and OEMs for a complete line of Hyundai-branded machines, components, and PC board manufacturing services. Samsung's J.S. Ko says he's signed a distributor agreement with Delta Distributing for his line of PC-compatibles, but he too is pushing a full line of components on an OEM basis. "We make our own semiconductors. We've accumulated technology to make the computer. And we have very high quality," Ko says.

...And So Are The Taiwanese

Most of their booths are tiny, and their names unfamiliar, but the Taiwanese were coming on fast at this COMDEX, too. They've got the products, and their prices are *crazy*.

How crazy? I asked Eric Cheng of Stage System Engineering for a retail price on his Taiwanese 80386-based "luggable" (26-pound) PC, with a 44 megabyte hard drive, and 1 megabyte of RAM. "$4,500," he said. How about a 2400 baud, Hayes-compatible modem from Link Technologies, also of Taiwan, for $269? Or an AT-compatible from Golden Star Technology with a 40 megabyte hard drive and EGA monitor for $2,000?

There are two ways you can look at this. Oh goody, we're getting bargains. Or you can look at it the Japanese way. Jeff Chou of R.P.T. Intergroup, another AT-compatible maker, was asked about his plans for the Japanese market, dominated by NEC. "We're trying to make an NEC-compatible computer for the Japanese market, but it's stuck in the R&D stages. It's difficult to get technical specifications from them." Food for thought.

Zenith's Mac-Like "eaZy PC"

Reporters I talked to positively raved about the Zenith "eaZy pc," a $995 list MS-DOS box with no slots, 3½ inch floppies, and a black-on-white screen with a new Mac-like operating interface from Microsoft called MS-DOS Manager. The machine is super-quiet, because there's no fan and the power supply is in the monitor. "This is the first MS-DOS PC with the ease of operation attributed to Apple's Macintosh," Zenith president Robert Dilworth said. Not in the press release, but admitted freely in the booth, this American Rocky is Made at a Zenith factory in ... (ahem) Taiwan.

That's far from all. Zenith said it is now shipping a new Intel 80386-based PC which is compatible with IBM's new VGA standard, as well as its old EGA and CGA standards. Dilworth said this machine can process three million instructions per second and has up to 10 AT-style slots. Prices for the Model 40 and Model 80 are from $6,500-7,500, and they both come with Microsoft *Windows* standard. Finally, Zenith showed off its new Flat Color Monitor, a 14-inch screen Dilworth claimed "outperforms professional graphics displays that cost $5-10,000." The price: $1,000. CONTACT: Glen Nelson, Zenith Data Systems, (312) 699-4839.

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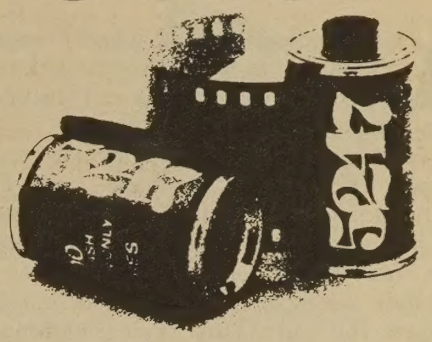

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DVORAK'S LAST COLUMN

Button, Button, Who's Got The Button?

By John C. Dvorak

Another column! About what? Computers? Who needs to listen to some jerk ramble on and on about IBM PCs and Macintoshes month after month? Who cares?

I don't care about this stuff anymore, so don't despair. This column is an experiment. This is all that's possible because on Feb. 14, 1987, all the new ideas were used up. I think it was the *New York Times* that declared it. They were probably wrong by a day or two, but it did happen. The well ran dry. There is nothing more to say about computers. This is my last column, ever.

It's too bad, since things have gone so well until now. Then again, I've gained 20 pounds because of columns like this, and I have this urge to collect those dumb computer buttons that the UNIX hacks wear. No, *I* don't wear them. Well, once in a while. I mean, you've got to face it, some of the buttons *are* funny. I'm amused by the overt sexual innuendo that most of them convey. Have you ever noticed?

Ninety per cent of the computer world is male (at least at the trade shows), so to get any attention, you have to advertise. I can just imagine the great response you'll get from that blonde bombshell when she sees your U.S. Video button that says: "Get Over Laid." Har, har. Get it? Pretty sexy, huh? Let's not forget the classics from TG Products: "Wanna Play With My Joystick?" and "Come Ball With Us." TG also sells track balls. I think wearing these keen buttons while drooling and stuttering will get you that dinner date.

Computerworld started this button phenomenon with its innuendo buttons like "Do You Output?" or "Is Your Brain as Good as Your Baud?" Soon these evolved into buttons bordering on bad taste from bold button makers like 10 Net and it's "Get It Up and Keep It Up with 10 Net." Sure, sure, they're talking about keeping a network up and running. Wink, wink.

Let's not forget the old "Do it . . . " jokes. These are the ones that use the generic phrase opener "do it . . . " and add some sexual innuendo. From the simplistic button from Mercury Computer Systems and its "Do It With Zip" to AT&T's button "I Do It Simultaneously," they are all high schoolish gags for a business filled with 40-year-old teenagers.

So what happens when a guy at a show (or on the street for that matter) sees some knockout gal wearing, say, the Computer Intelligence "I Love Orders" or Blast's "Let's Have A Blast!" button? They choke up and develop a twitch, that's what.

I'm amused by the acceptance of this button phenomenon in a business that is minimally Victorian if not downright prudish. For example, just from this column, the editor will get a slug of letters that all say the same thing: "I read *MicroTimes* to get hard facts. I am offended by Mr. Dvorak's column where he uses the word 'sex' and then discusses prurient buttons that are nothing less than obscene. If I want obscenity then I'll subscribe to *Playboy*. Humph! I will cancel my subscription if this happens again." This is the same guy that will be drooling and tittering at the trade show.

Not all the buttons are funny or sexy. Only the best ones are. Some are pure junk. I've got one that simply says, "I Love Mitsubishi" using the heart to connote the word "love." How dull and uncreative. Then there's a huge green (and obviously expensive) button from ADAGE that says, "It's About Time." Gee, that one has me mesmerized. Talk about dull. If you're going to make a dumb button, then at least keep it small. An example is the smallish "HAL-lelujah!" button from Lotus. Dumb, but small.

Now where was I? Oh, yes. I was discussing the fact that there is nothing more to write about in this business. Perhaps next month I'll go into more detail. For now, I have to put my button collection back. □

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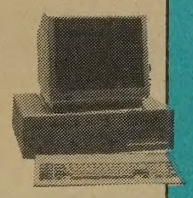

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